

SHARP SERVICE MANUAL

S5708R2397H/X

COMMERCIAL MICROWAVE OVEN



MODEL **R-2397**

In interests of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

TABLE OF CONTENTS

	Page
CAUTION, MICROWAVE RADIATION	1
WARNING	1
PRODUCT SPECIFICATIONS	2
GENERAL IMPORTANT INFORMATION	2
APPEARANCE VIEW	3
OPERATION SEQUENCE	4
FUNCTION OF IMPORTANT COMPONENTS	5
SERVICING	7
TEST PROCEDURE	10
TOUCH CONTROL PANEL ASSEMBLY	17
COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE	24
MICROWAVE MEASUREMENT	29
WIRING DIAGRAM	30
PICTORIAL DIAGRAM	31
CONTROL PANEL CIRCUIT	32
PRINTED WIRING BOARD	33
PARTS LIST	34

SHARP CORPORATION

SERVICE MANUAL

SHARP

COMMERCIAL

R-2397

GENERAL IMPORTANT INFORMATION

This Manual has been prepared to provide Sharp Corp. Service engineers with Operation and Service Information.

It is recommended that service engineers carefully study the entire text of this manual, so they will be qualified to render satisfactory customer service.

CAUTION MICROWAVE RADIATION

DO NOT BECOME EXPOSED TO RADIATION FROM THE MICROWAVE GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

Service engineers should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected. All input and output microwave connections, waveguides, flanges and gaskets must be secured. Never operate the device without a microwave energy absorbing load attached. Never look into an open waveguide or antenna while the device is energized.

WARNING

Never operate the oven until the following points are ensured.

- (A) The door is tightly closed.
- (B) The door brackets and hinges are not defective.
- (C) The door packing is not damaged.
- (D) The door is not deformed or warped.
- (E) There is not any other visible damage with the oven.

Servicing and repair work must be carried out only by trained service engineers.

All the parts marked "*" on parts list are used at voltages more than 250V.

Removal of the outer wrap gives access to potentials above 250V.

All the parts marked "Δ" on parts list may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

SHARP CORPORATION

OSAKA, JAPAN

PRODUCT SPECIFICATIONS

GENERAL INFORMATION

APPEARANCE VIEW

OPERATING SEQUENCE

FUNCTION OF IMPORTANT COMPONENTS

SERVICING AND TROUBLESHOOTING CHART

TEST PROCEDURE

TOUCH CONTROL PANEL ASSEMBLY

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

MICROWAVE MEASUREMENT

WIRING DIAGRAM

PARTS LIST

PRODUCT DESCRIPTION

SPECIFICATION

ITEM	DESCRIPTION															
Power Requirements	230 Volts 50 Hertz Single phase, 3 wire grounded															
Power Consumption	2.7 kW Approx. 13A															
Power Output	1700 watts nominal of RF microwave energy (Method of IEC 705) Operating frequency of 2450MHz															
Outside Dimensions	Width 510mm Height 335 mm Depth 470 mm															
Cooking Cavity Dimensions	Width 330 mm Height 180 mm Depth 330 mm															
Control Complement	<p>Touch Control System</p> <p><u>The combination of cooking time and microwave power</u> The oven can be programmed a series of up to 3 cooking stages. The combination of microwave power and cooking time that can be input as follows.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Cooking Sequence</th> <th style="text-align: center;">Microwave power level that can be used.</th> <th style="text-align: center;">Cooking time that can be used.</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1 Stage only</td> <td style="text-align: center;">0-100%</td> <td style="text-align: center;">Max. 30 minutes</td> </tr> <tr> <td rowspan="3" style="text-align: center;">2 or 3 Stage</td> <td rowspan="2" style="text-align: center;">0-40% all stages</td> <td style="text-align: center;">Max. 30 minutes any stages</td> </tr> <tr> <td style="text-align: center;">Max. 60 minutes for 2 stages</td> </tr> <tr> <td style="text-align: center;">50-100%</td> <td style="text-align: center;">Max. 90 minutes for 3 stages</td> </tr> <tr> <td colspan="3" style="text-align: center;">Max. 30 minutes for 3 stages</td> </tr> </tbody> </table> <p>NOTE: If the oven used with the power level above 40% on any stage, the maximum cooking time is 30 minutes in total.</p> <p>Microwave Power level 100% 90% 80% 70% 60% 50% 40% 30% 20% 10% 0%</p> <p>MANUAL / REPEAT key, NUMBER keys MICROWAVE POWER SETTING key STOP / CLEAR key, START Key DOUBLE QUANTITY key, DEFROST key SET key, CHECK key, VOLUME key</p>	Cooking Sequence	Microwave power level that can be used.	Cooking time that can be used.	1 Stage only	0-100%	Max. 30 minutes	2 or 3 Stage	0-40% all stages	Max. 30 minutes any stages	Max. 60 minutes for 2 stages	50-100%	Max. 90 minutes for 3 stages	Max. 30 minutes for 3 stages		
Cooking Sequence	Microwave power level that can be used.	Cooking time that can be used.														
1 Stage only	0-100%	Max. 30 minutes														
2 or 3 Stage	0-40% all stages	Max. 30 minutes any stages														
		Max. 60 minutes for 2 stages														
	50-100%	Max. 90 minutes for 3 stages														
Max. 30 minutes for 3 stages																
Set Weight	Approx. 33kg															

GENERAL INFORMATION

WARNING

THIS APPLIANCE MUST BE EARTHED

IMPORTANT

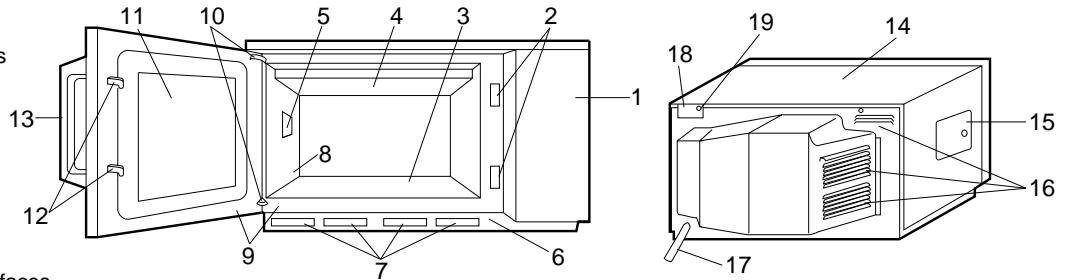
THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

GREEN-AND-YELLOW	: EARTH
BLUE	: NEUTRAL
BROWN	: LIVE

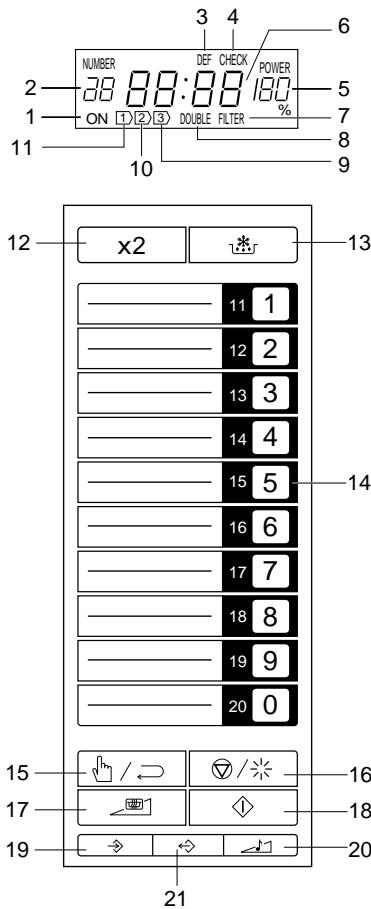
APPEARANCE VIEW

OVEN

1. Control panel
2. Hole for safety door latches
3. Ceramic floor
4. Splash cover
5. Oven light
6. Air intake filter
7. Air intake openings
8. Oven cavity
9. Door seals and sealing surfaces
10. Door hinges
11. Oven door with see-through window
12. Door safety latches
13. Door handle.
14. Outer cabinet
15. Removable cover over oven light bulb
16. Air vent openings
17. Power supply cord
18. Mounting plate
19. Screw for mounting plate



AUTO TOUCH CONTROL PANEL



DISPLAY AND INDICATORS

Check indicators after the oven starts to confirm the oven is operating as desired.

1. Heating indicator
This indicator shows cooking in progress.
2. Memory number indicator
3. Defrost indicator
4. Check mode indicator
5. Power level display
6. Time display
7. Filter indicator
8. Double quantity mode indicator
9. 3rd. stage indicator
10. 2nd. stage indicator
11. 1st. stage indicator

OPERATING KEYS

12. DOUBLE QUANTITY key
13. DEFROST key
14. NUMBER keys
15. MANUAL/ REPEAT key
16. STOP/CLEAR key
17. MICROWAVE POWER SETTING key
18. START key
19. SET key
20. VOLUME key
21. CHECK key

INSTALLATION INFORMATION

When this commercial microwave oven is installed near other commercial electrical appliances, connect a lead wire to each equivalent potential terminal with equipotential marking between them (insert a lead wire between a washer and an earth angle, and screw them), as shown in Fig. A-1, to make sure that they are at equivalent potential. If any lead wire is not connected between them, when person touch them he/she will get an electric shock.

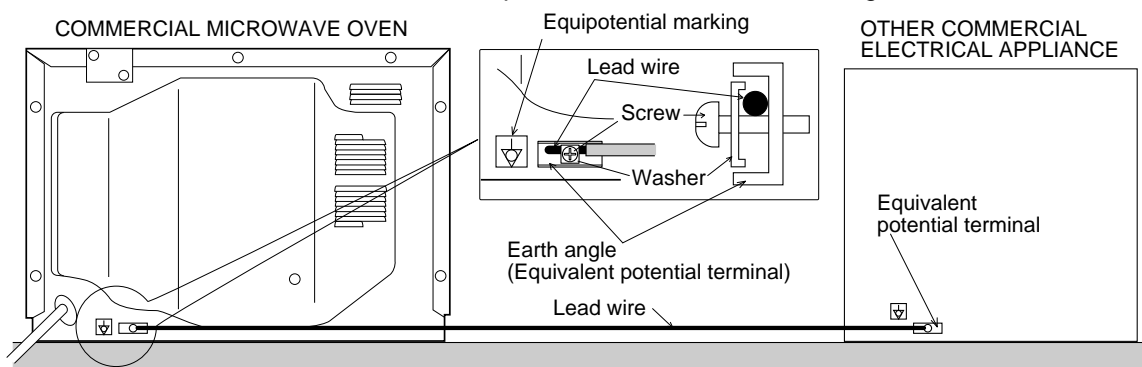


Figure A-1

OPERATION SEQUENCE

OFF CONDITION

Closing the door activates all door interlock switches (1st latch switch, 2nd latch switch, 3rd latch switch and stop switch)

IMPORTANT

When the oven door is closed, the monitor switch contacts COM-NC must be open. When the microwave oven is plugged in a wall outlet (230 volts, 50Hz), the line voltage is supplied to the point A5+A7 in the control panel.

Figure O-1 on page 30

1. The digital display shows

NOTE: When the door is opened or after cooking, oven lamp, blower motor and stirrer motors work for 1 minute.

MICROWAVE COOKING CONDITION

Touch MANUAL/ REPEAT key and enter a desired cooking time with the touching NUMBER key. And then touch START key.

Function sequence Figure O-2 on page 30

CONNECTED COMPONENTS	RELAY
Oven lamp/ Blower motor/ Stirrer motors	RY1
Power transformer (rear)	RY3
Power transformer (front)	RY4

- The line voltage is supplied to the primary winding of the high voltage transformer. The voltage is converted to about 3.3 volts A.C. output on the filament winding and high voltage of approximately 2000 volts A.C. on the secondary winding.
- The filament winding voltage (3.3 volts) heats the magnetron filament and the high voltage (2000 volts) is sent to the voltage doubling circuit, where it is doubled to negative voltage of approximately 4000 volts D.C..
- The 2450 MHz microwave energy produced in the magnetron generates a wave length of 12.24 cm. This energy is channelled through the waveguide (transport channel) into the oven cavity, where the food is placed to be cooked.
- When the cooking time is up, a signal tone is heard and the relays RY3+RY4 go back to their home position. The circuits to the high voltage transformers. The relay RY1 remains and oven lamp, blower motor and stirrer motors work for 1 minute.
- When the door is opened during a cook cycle, the switches come to the following condition.

SWITCH	CONTACT	CONDITION	
		DURING COOKING	DOOR OPEN (NO COOKING)
1st latch switch	COM-NO	Closed	Open
Monitor switch	COM-NC	Open	Closed
2nd latch switch	COM-NO	Closed	Open
Stop switch	COM-NO	Closed	Open
3rd latch switch	COM-NO	Closed	Open

The circuits to the high voltage transformers are cut off when the 1st latch, 2nd latch, 3rd latch and stop switches are made open. The blower motor, stirrer motors and oven lamp remains on even if the oven door is opened after the cooking cycle has been interrupted, because

the relay RY1 stays closed. Shown in the display is the remaining time, but the program is cancelled if the oven is not started within 3 minutes.

6. MONITOR SWITCH CIRCUIT

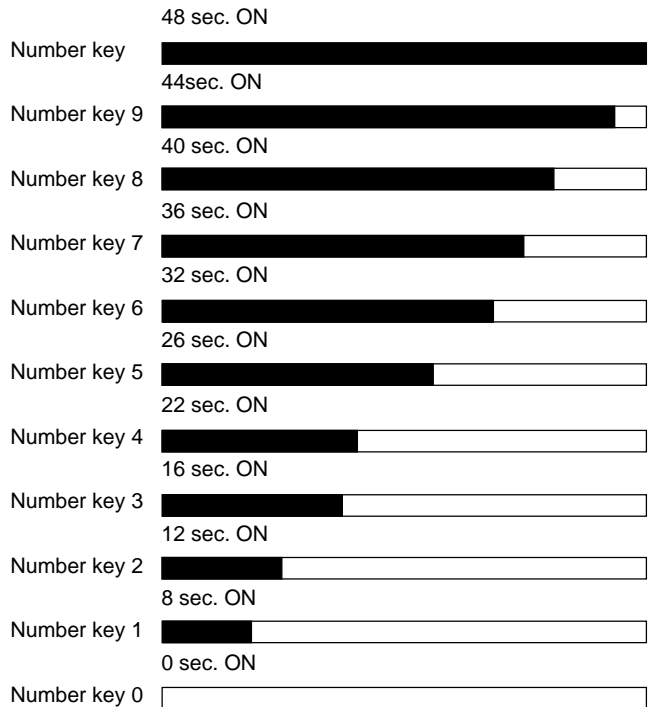
The monitor switch is mechanically controlled by oven door, and monitors the operation of the 1st latch switch.

- When the oven door is opened during or after the cycle of a cooking program, the 1st, 2nd, 3rd latch and stop switches must open their contacts first. After that the contacts (COM-NC) of the monitor switch can be closed.
- When the oven door is closed, the contacts (COM-NC) of the monitor switch must be opened first. After that the contacts (COM-NO) of the 1st, 2nd, 3rd latch and stop switches must be closed.
- When the oven door is opened and the contacts of the 1st latch switch remain closed, remains closed, the fuse F6.3A will blow, because the monitor switch is closed and a short circuit is caused.

MICROWAVE VARIABLE COOKING

When the microwave oven is preset for variable cooking power, the line voltage is supplied to the high voltage transformers intermittently within a 48 second time base through the contacts of the relays RY3+RY4.

The following levels of microwaves power are given.



NOTE: The ON/OFF time ratio does not exactly correspond to the percentage of microwave power, because approx. 3 seconds are needed for heating up the magnetron filament.

TWO MAGNETRON OPERATION SYSTEM

Two magnetrons MG1+MG2 are equipped in order to get higher microwave power output. The primary windings of the high voltage transformers T1+T2 are connected so that each magnetron can be oscillated alternatively according to the frequency of the power supply. Refer to the Figure 1 and 2.

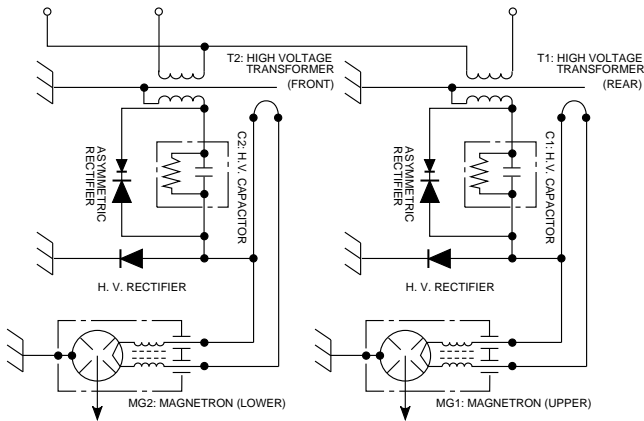


Figure B-1. High Voltage Circuit

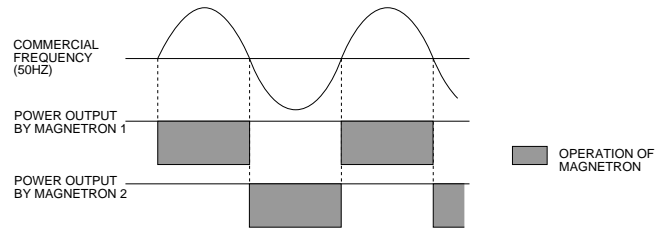


Figure B-2. Operation of Magnetron

FUNCTION OF IMPORTANT COMPONENTS

DOOR OPEN MECHANISM

1. The door release lever is pulled.
2. The upper latch head is lifted up by the linked door release lever.
3. The latch lever is lifted up by the door release lever.
4. The joint lever is lifted up by the latch lever.
5. The lower latch head is lifted up by the joint lever.
6. Now both latch heads are lifted up, so they can be released from the latch hook.
7. Now the door can be opened.

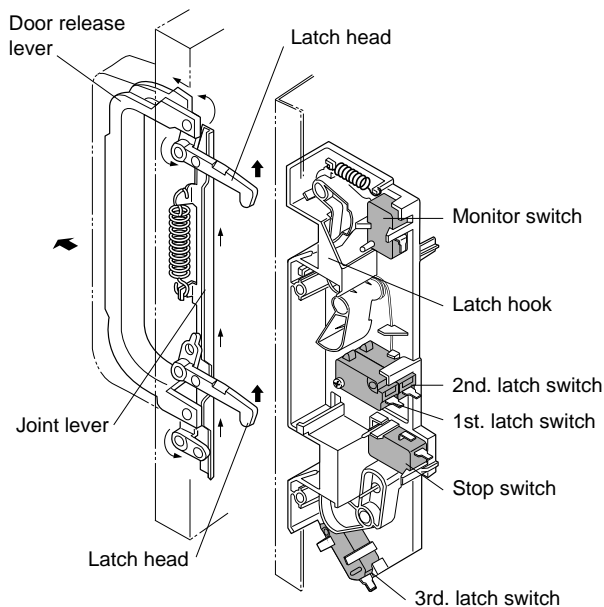


Figure D-1. Door Open Mechanism

1ST LATCH SWITCH, 2ND LATCH SWITCH, 3RD LATCH SWITCH AND STOP SWITCH

1. When the oven door is closed, the contacts COM-NO must be closed.
2. When the oven door is opened, the contacts COM-NO must be opened.

MONITOR SWITCH

The monitor switch is activated (the contacts opened) the upper latch head and switch lever A while the door is closed. The switch is intended to render the oven inoperative by means of blowing the fuse F6.3A when the contacts of the 1st latch switch fail to open when the door is opened.

Function

1. When the door is opened, the monitor switch contacts close (to the ON condition) due to their being normally closed. At this time the 1st latch switch is in the OFF condition (contacts open) due to their being normally open contact switches.
2. As the door goes to a closed position, the monitor switch contacts are opened and 1st latch switch contacts are closed (On opening the door, each of these switches operate inversely.)
3. If the door is opened and the 1st latch switch contacts fail to open, the fuse F6.3A blows simultaneously with closing of the monitor switch contacts.

CAUTION: BEFORE REPLACING A BLOWN FUSE F6.3A TEST THE 1ST LATCH SWITCH, MONITOR SWITCH AND MONITOR RESISTOR FOR PROPER OPERATION. (REFER TO CHAPTER "TEST PROCEDURE").

MONITOR RESISTOR

The monitor resistor prevents the fuse F6.3A 250V bursting when the fuse F6.3A 250V blows due to the operation of the monitor switch.

NOISE FILTER

The noise filter assembly prevents radio frequency interference that might flow back in the power circuit.

WEAK POINT

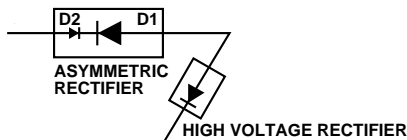
If the wire harness or electrical components make a short-circuit, this weak point blows to prevent an electric shock or fire hazard.

FUSE F6.3A 250V

1. If the wire harness or electrical components are short-circuited, this fuse blows to prevent an electric shock or fire hazard.
2. The fuse also blows when 1st latch switch remains closed with the oven door open and when the monitor switch closes.

ASYMMETRIC RECTIFIER

The asymmetric rectifier is solid state device that prevents current flow in both directions. And it prevents the temperature rise of the high voltage transformer by blowing the weak point when the high voltage rectifier is shorted.



The rated peak reverse voltage of D1 of the asymmetric rectifier is 6 KV. The rated peak reverse voltage of D2 of the asymmetric rectifier is 1.7 KV. D1 and D2 of the asymmetric rectifier or high voltage rectifier are shorted when the each peak reverse voltage goes beyond the each rated peak reverse voltage.

1. The high voltage rectifier is shorted by some fault when microwave cooking.
2. The peak reverse voltage of D2 of the rectifier goes beyond the rated peak reverse voltage 1.7 KV in the voltage doubler circuit.
3. D2 of the rectifier is shorted.
4. The large electric currents flow through the high voltage winding of the high voltage transformer.
5. The large electric currents flow through the primary winding of the high voltage transformer.
6. The weak point blows by the large electric currents.
7. The power supplying to the high voltage transformer is cut off.

EXHAUST THERMISTOR

The thermistor is a negative temperature coefficient type. The temperature in the exhaust duct is detected through the resistance of the thermistor.

If the temperature is high, the control panel will display "EE7" and the oven will stop to avoid overheating and catching fire.

If the thermistor is open, the control panel will display "EE6" and the oven will stop.

INTAKE THERMISTOR

This thermistor detects ambient air temperature.

MAGNETRON THERMISTOR

The air temperature around the lower magnetron is detected through the resistance of the thermistor.

If the temperature is high, the control panel will display "EE17" and the oven will stop to protect the lower magnetron against overheating.

If the thermistor is open, the control panel will display "EE16" and the oven will stop.

MAGNETRON THERMAL CUT-OUTS 145°

These thermal cut-outs protect the magnetrons against overheating. If their temperature goes up higher than 145°C because the blower motor is interrupted, the ventilation openings are blocked, the thermal cut-outs will open and the line voltage to the high voltage transformer will be cut off and the operations of the magnetrons will be stopped. The defective thermal cut-out must be replaced with a new rated one.

BLOWER MOTOR THERMAL CUT-OUT 115°C

This thermal cut-out protects the blower motor against overheating. If its temperature goes up higher than 115°C because the blower motor is locked or the ventilation openings are blocked, the contacts of the thermal cut-out will open and the line voltage to the control unit will be cut off and the operation of the oven will be stopped. The defective thermal cut-out must be replaced with a new rated one.

OVEN THERMAL CUT-OUT 115°C

This thermal cut-out protects the oven against overheating. If the temperature goes up higher than 115°C because the food catches fire, the contacts of thermal cut-out will open and the line voltage to the control unit will be cut off and the operation of the oven will be stopped. The defective thermal cut-out must be replaced with a new rated one.

BLOWER MOTOR

The blower motor drives a blade which draws external cool air. This cool air is directed through the air vanes surrounding the magnetrons and cools the magnetrons. This air is channelled through the oven cavity to remove steam and vapours given off from the heating foods. It is then exhausted through the exhausting air vents at the oven cavity.

STIRRER MOTOR

The stirrer motor drives a stirrer antenna to stir the microwave radiation from the waveguide.

SERVICING

WARNING TO SERVICE PERSONNEL

Microwave ovens contain circuitry capable of producing very high voltage and current. Contact with following parts will result in electrocution.

High voltage capacitor, High voltage transformer, Magnetron, High voltage rectifier assembly, High voltage harness.

REMEMBER TO CHECK **3D**

- 1) Disconnect the supply.
- 2) Door opened, and wedged open.
- 3) Discharge high voltage capacitor.

WARNING AGAINST THE CHARGE OF THE HIGH-VOLTAGE CAPACITOR

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is, of the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Sharp recommend that wherever possible fault-finding is carried out with the supply disconnected. It may in, some cases, be necessary to connect the supply after the outer case has been removed, in this event carry out 3D checks and then disconnect the leads to the primary of the high voltage transformer. Ensure that these leads remain isolated from other components and the oven chassis. (Use insulation tape if necessary.) When the testing is completed carry out 3D checks and reconnect the leads to the primary of the high voltage transformer.

When all service work is completed, and the oven is fully assembled, the microwave power output should be checked and microwave leakage test carried out.

REMEMBER TO CHECK **4R**

- 1) Reconnect all leads removed from components during testing.
- 2) Replace the outer case (cabinet).
- 3) Reconnect the supply.
- 4) Run the oven. Check all functions.

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven tray, close the door and press Manual / Repeat key and set the microwave time for one (1) minute. Set the power level to 100% and push the START button. When the one minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out 3D checks and re-examine the connections to the component being tested.

TROUBLESHOOTING GUIDE

When troubleshooting the microwave oven, it is helpful to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the "Test Procedure" section.

IMPORTANT: If the oven becomes inoperative because of a blown fuse **F2** F6.3A in the 1st latch switch - monitor switch - monitor resistor circuit, check the 1st latch switch, monitor switch and monitor resistor before replacing the fuse F6.3A.

TEST PROCEDURE		A	A	B	B	C	C	C	D	D	E	E	E	E	E	F	F	G	H	
POSSIBLE CAUSE AND DEFECTIVE PARTS		MAGNETRON MG1	MAGNETRON MG2	HIGH VOLTAGE TRANSFORMER T1	HIGH VOLTAGE TRANSFORMER T2	H.V. RECTIFIER ASSEMBLY FOR MG1	H.V. RECTIFIER ASSEMBLY FOR MG2	H.V. WIRE HARNESS	H.V. CAPACITOR C1	H.V. CAPACITOR C2	1ST. LATCH SWITCH	2ND. LATCH SWITCH	3RD. LATCH SWITCH	MONITOR SWITCH	STOP SWITCH	WEAK POINT A018 F3	WEAK POINT A018 F4	WEAK POINT A017 F1	FUSE 6.3A F2	
		CONDITION	PROBLEM																	
OFF CONDITION	" . " does not appear on display when power cord is plugged into wall outlet.																			
	Control panel can not accept key in.																			
	Fuse F6.3A blows when the door is opened.																			
	Home fuse blows when power cord is plugged into wall outlet.																			
	Weak point A017 blows when power cord is plugged into wall outlet.																			
	Oven lamp, fan motor and stirrer motors do not work for 1 minute whenever the door is opened or after cooking.																			
	Fuse F2 F6.3A blows when power cord is plugged into wall outlet.																			
	Oven lamp does not light when door is opened. (Blower and stirrer motors work)																			
	Blower motor does not work when door is opened. (Oven lamp lights and stirrer motors work)																			
ON CONDITION	"EE 1" appear in display.																			
	"EE 2" appear in display.																			
	"EE 3" appear in display .																			
	"EE 6" appear in display.																			
	"EE 7" appear in display.																			
	"EE 9" appear in display.																			
	Oven lamp, blower motor and stirrer motors do not work.																			
	Oven lamp does not work.																			
	Blower motor does not work.																			
	Oven does not stop after end of cooking cycle or when STOP/CLEAR key is touched. (Oven lamp, blower motor and stirrer motors stop.)																			
	Home fuse blows when starting the oven.																			
	Oven goes into cook cycle but shuts down before end of cooking cycle.																			
	Oven seems to be operating but no heat is produced in oven load.																			
	It passed more than 1 minute after cooking but oven lamp, blower motor and stirrer motors do not stop.																			
	"EE 0" appear in display .																			
	"EE 16" appear in display.																			
	"EE 17" appear in display.																			
	"EE 8" appear in display .																			
"EE 10" appear in display .																				
Stirrer motors do not work.																				

TEST PROCEDURES

PROCEDURE

LETTER COMPONENT TEST

A MAGNETRON TEST

NEVER TOUCH ANY PART IN THE CIRCUIT WITH YOUR HAND OR AN INSULATED TOOL WHILE THE OVEN IS IN OPERATION.

CARRY OUT 3D CHECK.

Isolate the magnetron from high voltage circuit by removing all leads connected to filament terminal.

To test for an open circuit filament use an ohmmeter to make a continuity test between the magnetron filament terminals, the meter should show a reading of less than 1 ohm.

To test for short filament to anode condition, connect ohmmeter between one of the filament terminals and the case of the magnetron (ground). This test should be indicated an infinite resistance. If a low or zero resistance reading is obtained then the magnetron should be replaced.

MICROWAVE OUTPUT POWER (IEC-705-1988)

The following test procedure should be carried out with the microwave oven in a fully assembled condition (outer case fitted). Microwave output power from the magnetron can be measured by way of IEC 705, i.e. It is measured by how much power the water load can absorb. To measure the microwave output power in the microwave oven, the relation of calorie and watt is used. When P(W) heating works for t(second), approximately $P \times t / 4.187$ calorie is generated. On the other hand, if the temperature of the water with V(ml) rises ΔT ($^{\circ}\text{C}$) during this microwave heating period, the calorie of the water is $V \times \Delta T$.

The formula is as follows;

$$P \times t / 4.187 = V \times \Delta T \qquad P \text{ (W)} = 4.187 \times V \times \Delta T / t$$

Our condition for water load is as follows:

Room temperature around 20 $^{\circ}\text{C}$	Power supply Voltage Rated voltage
Water load 1000 g	Initial temperature 10 \pm 2 $^{\circ}\text{C}$
Heating time 25 sec.	P=170x ΔT

Measuring condition:

1. Container
The water container must be a cylindrical borosilicate glass vessel having a maximum material thickness of 3 mm and an outside diameter of approximately 190 mm.
2. Temperature of the oven and vessel
The oven and the empty vessel are at ambient temperature prior to the start the test.
3. Temperature of the water
The initial temperature of the water is (10 \pm 2) $^{\circ}\text{C}$.
4. Select the initial and final water temperature so that the maximum difference between the final water temperature and the ambient temperature is 5K.
5. Select stirring devices and measuring instruments in order to minimize addition or removal of heat.
6. The graduation of the thermometer must be scaled by 0.1 $^{\circ}\text{C}$ at minimum and can be accurate thermometer.
7. The water load must be (1000 \pm 5) g.
8. "t" is measured while the microwave generator is operating at full power. Magnetron filament heat-up time is not included.

NOTE: The operation time of the microwave oven is "t + 3" sec. (3 sec. is magnetron filament heat-up time.) Therefore total reheating time = 28 seconds.

Measuring method:

1. Measure the initial temperature of the water before the water is added to the vessel.
(Example: The initial temperature T1 = 11 $^{\circ}\text{C}$)
2. Add the 1 litre water to the vessel.
3. Place the load on the centre of the shelf.
4. Operate the microwave oven at HIGH for the temperature of the water rises by a value ΔT of (10 \pm 2) K.
5. Stir the water to equalize temperature throughout the vessel.
6. Measure the final water temperature. (Example: The final temperature T2 = 21 $^{\circ}\text{C}$)
7. Calculate the microwave power output \underline{P} in watts from above formula.

TEST PROCEDURES

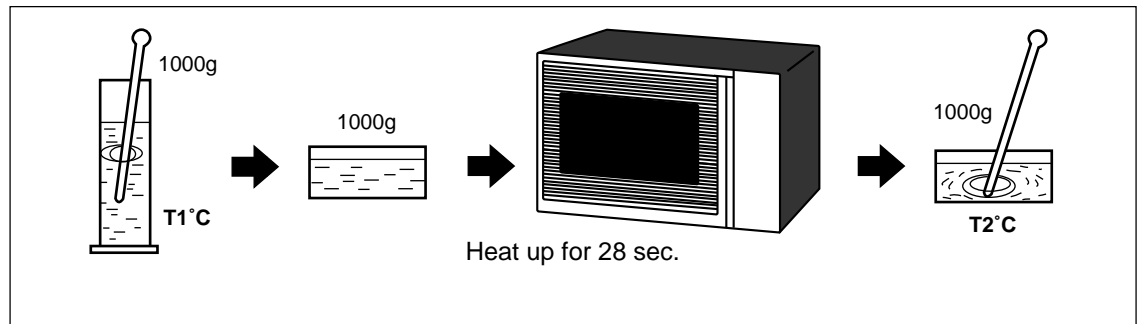
PROCEDURE

LETTER COMPONENT TEST

Initial temperature	T1 = 11°C
Temperature after (25 + 3) = 28 sec.	T2 = 21°C
Temperature difference Cold-Warm	$\Delta T = 10^\circ\text{C}$
Measured output power	
The equation is "P = 170 x ΔT "	P = 170 x 10°C = 1700 Watts

JUDGMENT: The measured output power should be at least $\pm 15\%$ of the rated output power.

CAUTION: 1°C CORRESPONDS TO 170 WATTS. REPEAT MEASUREMENT IF THE POWER IS INSUFFICIENT.



B HIGH VOLTAGE TRANSFORMER TEST

WARNING: High voltages and large currents are present at the secondary winding and filament winding of high voltage transformer. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements of the high-voltage circuits, including the magnetron filament.

CARRY OUT 3D CHECKS.

Disconnect the leads to the primary winding of the high voltage transformer. Disconnect the filament and secondary winding connections from the rest of the HV circuitry. Using an ohmmeter, set on a low range, it is possible to check the continuity of all three windings. The following readings should be obtained:

a. Primary winding	approx. 1.06 Ω
b. Secondary winding	approx. 57.3 Ω
c. Filament winding	less than 1 Ω

If the reading obtained are not stated as above, then the high voltage transformer is probably faulty and should be replaced.

CARRY OUT 4R CHECKS.

C HIGH VOLTAGE RECTIFIER ASSEMBLY TEST

HIGH VOLTAGE RECTIFIER TEST

CARRY OUT 3D CHECKS.

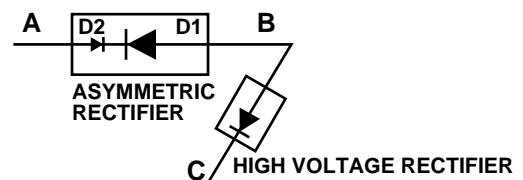
Isolate the high voltage rectifier assembly from the HV circuit. The high voltage rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminal B+C of the high voltage rectifier and note the reading obtained. Reverse the meter leads and note this second reading.

The normal resistance is infinity in one direction and more than 100 k Ω in the other direction.

CARRY OUT 4R CHECKS.

ASYMMETRIC RECTIFIER TEST

CARRY OUT 3D CHECKS.



TEST PROCEDURES

PROCEDURE

LETTER COMPONENT TEST

Isolate the high voltage rectifier assembly from the HV circuit. The asymmetric rectifier can be tested using an ohmmeter set to its highest range. Contact the ohmmeter across the terminals A+B of the asymmetric rectifier and note the reading obtained. Reverse the meter leads and note this second reading. If an open circuit is indicated in both directions then the asymmetric rectifier is good. If an asymmetric rectifier is shorted in either direction, then the asymmetric rectifier is probably faulty and must be replaced with high voltage rectifier. When the asymmetric rectifier is defective, check whether magnetron, high voltage rectifier, high voltage wire or filament winding of the high voltage transformer is shorted.

CARRY OUT 4R CHECKS.

NOTE: FOR MEASUREMENT OF THE RESISTANCE OF THE RECTIFIER, THE BATTERIES OF THE MEASURING INSTRUMENT MUST HAVE A VOLTAGE AT LEAST 6 VOLTS, BECAUSE OTHERWISE AN INFINITE RESISTANCE MIGHT BE SHOWN IN BOTH DIRECTIONS.

D HIGH VOLTAGE CAPACITOR TEST

CARRY OUT 3D CHECKS.

- A. Isolate the high voltage capacitor from the circuit.
- B. Continuity check must be carried out with measuring instrument which is set to the highest resistance range.
- C. A normal capacitor shows continuity for a short time (kick) and then a resistance of about 10MΩ after it has been charged.
- D. A short-circuited capacitor shows continuity all the time.
- E. An open capacitor constantly shows a resistance about 10 MΩ because of its internal 10MΩ resistance.
- F. When the internal wire is opened in the high voltage capacitor shows an infinite resistance.
- G. The resistance across all the terminals and the chassis must be infinite when the capacitor is normal.

If incorrect reading are obtained, the high voltage capacitor must be replaced.

CARRY OUT 4R CHECKS.

E SWITCH TEST

CARRY OUT 3D CHECK.

Isolate the switch to be tested and using an ohmmeter check between the terminals as described in the following table.

Table: Terminal Connection of Switch

Plunger Operation	COM to NO	COM to NC
Released	O.C.	S.C.
Depressed	S.C.	O.C.

COM; Common terminal

NO; Normally open terminal

NC; Normally close terminal

S.C.; Short circuit

O.C.; Open circuit

If incorrect readings are obtained, make the necessary switch adjustment or replace the switch.

CARRY OUT 4R CHECKS.

F WEAK POINT A018

CARRY OUT 3D CHECKS.

If the weak point A018 is blown, there could be a short in the asymmetric rectifier or there is a ground in wire harness. A short in the asymmetric rectifier may have occurred due to short or ground in H.V. rectifier, magnetron, high voltage transformer or H.V. wire. Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4R CHECKS.

CAUTION: Only replace weak point A018 with the correct value replacement.

TEST PROCEDURES

PROCEDURE	LETTER	COMPONENT TEST												
G	<u>WEAK POINT A017</u>	<p>CARRY OUT <u>3D</u> CHECKS.</p> <p>If the weak point A017 is blown, there could be a shorts or grounds in electrical parts or wire harness. Check them and replace the defective parts or repair the wire harness.</p> <p>CARRY OUT <u>4R</u> CHECKS.</p> <p>CAUTION: Only replace weak point A017 with the correct value replacement.</p>												
H	<u>FUSE F6.3A TEST</u>	<p>CARRY OUT <u>3D</u> CHECKS.</p> <p>If the fuse F6.3A is blown when the door is opened, check the latch switch, monitor switch and monitor resistor.</p> <p>If the fuse F6.3 is blown by incorrect door switching replace the defective switch(s) and the fuse F6.3A.</p> <p>CARRY OUT <u>4R</u> CHECKS.</p> <p>CAUTION: Only replace fuse with the correct value replacement.</p>												
I	<u>THERMAL CUT-OUT TEST</u>	<p>CARRY OUT <u>3D</u> CHECKS.</p> <p>Disconnect the leads from the terminals of the thermal cut-out. Then using an ohmmeter, make a continuity test across the each two terminals as described in the table below.</p> <p>CARRY OUT <u>4R</u> CHECKS.</p> <p style="text-align: center;">Table: Thermal Cut-out Test</p> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th style="width: 25%;">Parts Name</th> <th style="width: 25%;">Temperature of "ON" condition (closed circuit). (°C)</th> <th style="width: 25%;">Temperature of "OFF" condition (open circuit).</th> <th style="width: 25%;">Indication of ohmmeter (When room temperature (°C) is approx. 20°C.)</th> </tr> </thead> <tbody> <tr> <td>Thermal cut-out 145°C</td> <td>This is not resetable type.</td> <td>Above 145°C</td> <td>Closed circuit.</td> </tr> <tr> <td>Thermal cut-out 115°C</td> <td>This is not resetable type.</td> <td>Above 115°C</td> <td>Closed circuit</td> </tr> </tbody> </table> <p>If incorrect readings are obtained, replace the thermal cut-out.</p> <p>An open circuit oven thermal cut-out 115°C indicates that the oven cavity has over heated, this may be due to no load operation.</p> <p>An open circuit magnetron thermal cut-out 145°C indicates that the magnetron has overheated, this may be due to restricted ventilation, cooling fan failure or a fault condition within the magnetron or HV circuit.</p> <p>An open circuit blower motor thermal cut-out 115°C indicates the blower motor winding has overheated, this may be due to resisted ventilation or locked cooling fan.</p>	Parts Name	Temperature of "ON" condition (closed circuit). (°C)	Temperature of "OFF" condition (open circuit).	Indication of ohmmeter (When room temperature (°C) is approx. 20°C.)	Thermal cut-out 145°C	This is not resetable type.	Above 145°C	Closed circuit.	Thermal cut-out 115°C	This is not resetable type.	Above 115°C	Closed circuit
Parts Name	Temperature of "ON" condition (closed circuit). (°C)	Temperature of "OFF" condition (open circuit).	Indication of ohmmeter (When room temperature (°C) is approx. 20°C.)											
Thermal cut-out 145°C	This is not resetable type.	Above 145°C	Closed circuit.											
Thermal cut-out 115°C	This is not resetable type.	Above 115°C	Closed circuit											
J	<u>MONITOR RESISTOR TEST</u>	<p>CARRY OUT <u>3D</u> CHECKS.</p> <p>Disconnect the leads from the monitor resistor. Using an ohmmeter and set on a low range. Check between the terminals of the monitor resistor.</p> <p style="text-align: center;">The resistance of monitor resistor should be read approx. 4.3Ω.</p> <p>If incorrect readings are obtained, replace the monitor resistor.</p> <p>CARRY OUT <u>4R</u> CHECKS.</p>												

TEST PROCEDURES

PROCEDURE
LETTER COMPONENT TEST

K MAGNETRON THERMISTOR TEST

CARRY OUT 3D CHECKS.

Disconnect connector-H from the CPU unit. Measure the resistance of the thermistor with an ohmmeter. Connect the ohmmeter leads to the leads of the thermistor.

Room Temp.	Resistance
15°C	Approx. 15.91 kΩ
20°C	Approx. 13.04 kΩ
25°C	Approx. 10.74 kΩ

If the meter does not indicate above resistance, replace the thermistor.

CARRY OUT 4R CHECKS.

EXHAUST THERMISTOR TEST

CARRY OUT 3D CHECKS.

Disconnect connector-B from the CPU unit. Measure the resistance of the thermistor with an ohmmeter. Connect the ohmmeter leads to the leads of the thermistor.

Room Temp.	Resistance
15°C	Approx. 77.45 kΩ
20°C	Approx. 61.47 kΩ
25°C	Approx. 49.12 kΩ

If the meter does not indicate above resistance, replace the thermistor.

CARRY OUT 4R CHECKS.

INTAKE THERMISTOR TEST

CARRY OUT 3D CHECKS.

Disconnect connector-D from the CPU unit. Measure the resistance of the thermistor with an ohmmeter. Connect the ohmmeter leads to the leads of the thermistor.

Room Temp.	Resistance
15°C	Approx. 15.88 kΩ
20°C	Approx. 13.03 kΩ
25°C	Approx. 10.74 kΩ

If the meter does not indicate above resistance, replace the thermistor.

CARRY OUT 4R CHECKS.

L MOTOR WINDING TEST

CARRY OUT 3D CHECKS.

Disconnect the leads from the motor. Using an ohmmeter, check the resistance between the two terminals.

Resistance of Blower motor should be approximately 52Ω.
Resistance of Stirrer motor should be approximately 8.8 kΩ.

If incorrect readings are obtained, replace the motor.

CARRY OUT 4R CHECKS.

M NOISE FILTER TEST

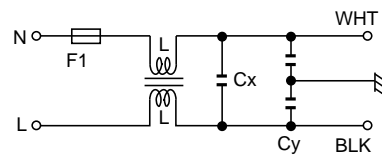
CARRY OUT 3D CHECKS.

Disconnect the leads from the terminals of noise filter. Using an ohmmeter, check between the terminals as described in the following table.

TEST PROCEDURES

PROCEDURE

LETTER COMPONENT TEST



L (min)	Cx ± 20%	Cy ± 20%
0.5mH	0.22 μF	4700 pF

MEASURING POINT	INDICATION OF OHMMETER
Between N and L	Open circuit
Between terminal N and WHITW	Short circuit
Between terminal L and BLK	Short circuit

If incorrect readings are absorbed, replace the noise filter.

CARRY OUT 4R CHECKS.

N TOUCH CONTROL PANEL ASSEMBLY TEST

The touch control panel consists of circuits including semiconductors such as LSI, IC, etc. Therefore, unlike conventional microwave ovens, proper maintenance cannot be performed with only a voltmeter and ohmmeter. In this service manual, the touch control panel assembly is divided into two units, Control Unit and Switch Unit, troubleshooting by unit replacement is described according to the symptoms indicated.

1. Key Unit

The following symptoms indicate a defective key unit. Replace the key unit.

- a) When touching the pads, a certain pad produces no signal at all.
- b) When touching the pads, sometimes a pad produces no signal.

2. Control Unit

The following symptoms may indicate a defective control unit. Replacing the control unit.

2-1 Programming problems.

- a) When touching the pads, a certain group of pads do not produce a signal.

2-2 Display problems.

- a) For a certain digit, all or some segments do not light up.
- b) For a certain digit, brightness is low.
- c) Only one indicator does not light.
- d) The corresponding segments of all digits do not light up; or they continue to light up.
- e) Wrong figure appears.
- f) A certain group of indicators do not light up.
- g) The figure of all digits flicker.

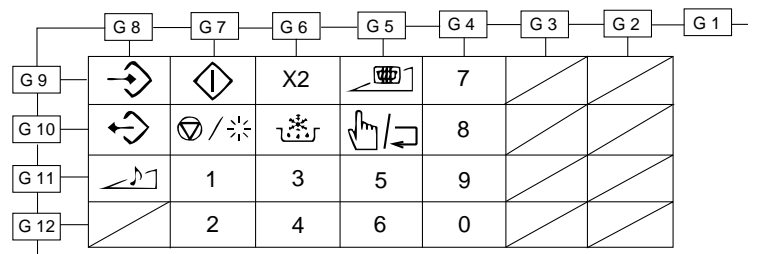
2-3 Other possible problems caused by defective control unit.

- a) Buzzer does not sound or continues to sound.
- b) Cooking is not possible.

Note: When defective components, (the Control Unit or Key Unit) are replaced, the defective part or parts must be properly packed for return in the shipping carton, with its cushion material, in which the new replacement part was shipped to you.

O KEY UNIT TEST

If the display fails to clear when the STOP/CLEAR pad is depressed, first verify the flat ribbon is making good contact, verify that the door sensing switch (stop switch) operates properly; that is the contacts are closed when the door is closed and open when the door is open. If the door sensing switch (stop switch) is good, disconnect the flat ribbon cable that connects the key unit to the control unit and make sure the door sensing switch is closed (either close the door or short the stop switch connector). Use the key unit matrix indicated on the control panel schematic and place a jumper wire between the pins that correspond to the STOP/CLEAR pad making momentary contact. If the control unit responds by clearing with a beep, the key unit is faulty and must be replaced. If the control unit does not respond, it is faulty and must be replaced.



TEST PROCEDURES (CONT'D)

PROCEDURE LETTER

COMPONENT TEST

If a specific pad does not respond, the above method may be used (after clearing the control unit) to determine if the control unit or key pad is at fault.

P RELAY TEST

CARRY OUT 3D CHECKS.

Remove the outer case and check voltage between Pin Nos. 5 and 7 of the connector (A) on the control unit with an A.C. voltmeter. The meter should indicate 230 volts, if not check control unit circuitry.

RY1, RY3 and RY4 Relay Test

These relays are operated by D.C. voltage.

Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation.

DC. voltage indicated Defective relay.

DC. voltage not indicated Check diode which is connected to the relay coil. If diode is good, control unit is defective.

RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS
RY1	APPROX. 19.0V D.C.	Oven lamp, Blower motor and Stirrer motor
RY3	APPROX. 16.0V D.C.	Power transformer 1
RY4	APPROX. 18.0V D.C.	Power transformer 2

CARRY OUT 4R CHECKS.

Q PROCEDURES TO BE TAKEN WHEN THE FOIL PATTERN ON THE PRINTED WIRING BOARD (PWB) IS OPEN

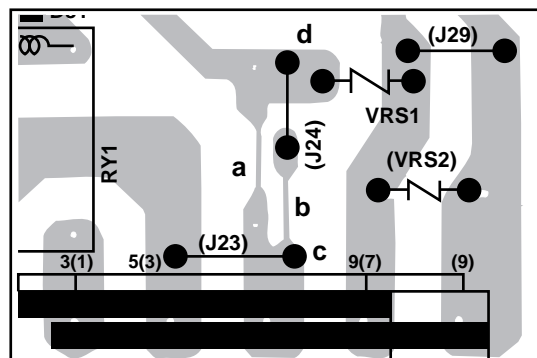
To protect the electronic circuits, this model is provided with a fine foil pattern added to the primary on the PWB, this foil pattern acts as a fuse. If the foil pattern is open, follow the troubleshooting guide given below for repair.

Problem: POWER ON, indicator does not light up.

CARRY OUT 3D CHECKS.

STEPS	OCCURANCE	CAUSE OR CORRECTION
1	The rated AC voltage is not present at POWER terminal of CPU connector (CN-A).	Check supply voltage and oven power cord.
2	The rated AC voltage is present at primary side of low voltage transformer.	Low voltage transformer or secondary circuit defective. Check and repair.
3	Only pattern at "a" is broken.	*Insert jumper wire J24 and solder. (CARRY OUT <u>3D</u> CHECKS BEFORE REPAIR)
4	Pattern at "a" and "b" are broken.	*Insert the coil RCILF2003YAZZ between "c" and "d". (CARRY OUT <u>3D</u> CHECKS BEFORE REPAIR)

NOTE: *At the time of these repairs, make a visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short-circuit (check primary coil resistance). If any abnormal condition is detected, replace the defective parts.



CARRY OUT 4R CHECKS.

TOUCH CONTROL PANEL ASSEMBLY

OUTLINE OF TOUCH CONTROL PANEL

The touch control section consists of the following units as shown in the touch control panel circuit.

- (1) Control Unit
- (2) Key Unit

The principal functions of these units and the signals communicated among them are explained below.

1. Control Unit

Signal of key touch and oven function control are all processed by one microcomputer.

1) Power Supply Circuit

This circuit changes output voltage at the secondary side of the low voltage (T1) transformer to voltages required at each part by full wave rectifying circuit, constant voltage circuit, etc..

2) ACL Circuit

This is an Auto-clear Circuit, i.e., a reset circuit, which enables IC1 to be activated from initial state.

3) Power SYNC Signal Generating Circuit

This is a circuit for generating power SYNC signal by virtue of the secondary side output of transformer T1. This signal is used for a basic frequency to time processing and so on.

4) Clock Circuit

This is a circuit for controlling clock frequency required for operating IC1.

5) IC1 (Main Processor)

This is a one-chip microcomputer, responsible for controlling the entire control unit.

6) IC2 (Memory Processor)

This is a memory IC, responsible for memory function.

7) Display Circuit

This is a circuit for driving display tubes by IC1 output.

8) Key Input Circuit

This is a circuit for transmitting key input information to IC1.

9) Sound-body Driving Circuit

This is a circuit for driving sound body by IC1 output.

10) Relay Driving Circuit

This is a circuit for driving output relay by IC1 output.

11) Stop Switch Circuit

This is a circuit for driving IC1 to detect door opening/closing.

12) Exhaust Air Temperature Detecting Circuit

This is a circuit for transmitting output change of thermistor (Exhaust Air Temperature Sensor) to IC1.

13) High Voltage Monitoring Circuit.

This circuit detects problems in the magnetron / high voltage circuit by sensing a variation in the current flowing through the primary winding of the high voltage transformer.

During heating, the primary current of the high voltage transformers also flows through the primary winding of the current transformers CT1 and CT2. This causes a current to be induced in the secondary windings of CT1/CT2 and results in an AC voltage which is determined by R61/R62.

This AC voltage is then half wave rectified by D61/D62 and smoothed (filtered) by C61/C62.

This AC voltage is the input to the IN3 and IN5 ports of IC1, which determines if there is a magnetron / high voltage problem.

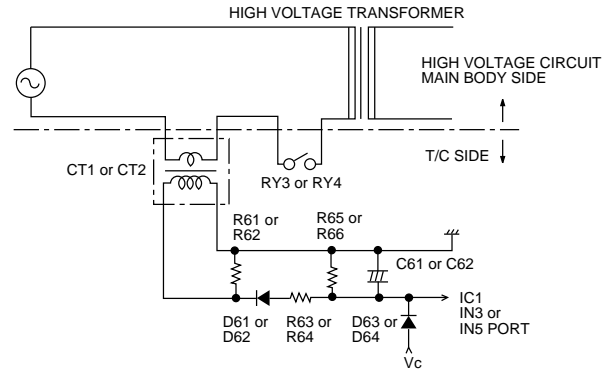


Figure T-1. High Voltage Monitoring Circuit

14) Magnetron Temperature Circuit. (Detect Noload or Fan Lock)

This is a circuit for transmitting output change of thermistor (Magnetron Temperature Sensor) to IC1.

15) Intake Air Temperature Detecting Circuit.

This is a circuit for transmitting output change of thermistor (Intake Air Sensor) to IC1.

2. Key Unit

The key unit is composed of a matrix circuit in which when a key is touched, one of signals P11, P12, P15, P16 and P17 generated by the LSI, is passed through the key and returned to the LSI as one of signals R0--R3. This model has 20 Memory pads. When the oven is shipped, Memory pad 1 to 10 are set as follows: fig. 1.

Memory No.	Cook Time	Output Power
1	5sec.	100%
2	10sec.	100%
3	20sec.	100%
4	30sec.	100%
5	40sec.	100%
6	50sec.	100%
7	1min.	100%
8	1min.15sec.	100%
9	1min.30sec.	100%
10	2min.	100%

(fig. 1)

This model has a double quantity pad. When the oven is shipped, Magnification "1.8" is preset in the double quantity pad. This model has an defrost pad. When the oven is shipped, defrost is set as follows: fig.2.

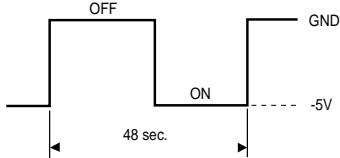
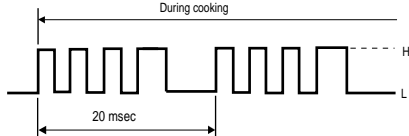
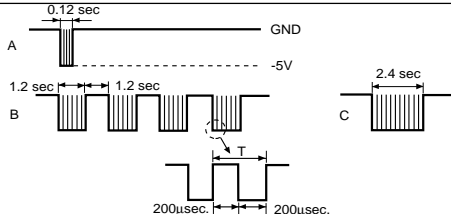
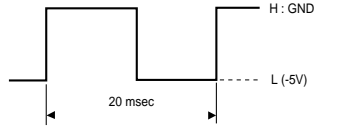
	1 STAGE
POWER	10%
OVEN ON/OFF	ON

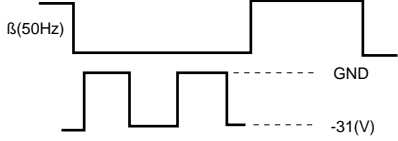
(fig. 2)

DESCRIPTION OF LSI

LSI(IZA646DR)

The I/O signal of the LSI(IZA646DR) is detailed in the following table.

Pin No.	Signal	I/O	Description																																										
1	VREF	IN	Reference voltage input terminal. A reference voltage applied to the A/D converter in the LSI. Connected to GND.(0V)																																										
2	IN7	IN	Temperature measurement input: MAGNETRON THERMISTOR. By inputting DC voltage corresponding to the temperature detected by the thermistor, this input is converted into temperature by the A/D converter built into the LSI.																																										
3	IN6	IN	Temperature measurement input: EXHAUST THERMISTOR. By inputting DC voltage corresponding to the temperature detected by the thermistor, this input is converted into temperature by the A/D converter built into the LSI.																																										
4	IN5	IN	A/D input for troubleshooting Magnetron 1.																																										
5	IN4	IN	Terminal to change functions according to the model. Signal in accordance with the model in operation is applied to set up its function.																																										
6	IN3	IN	A/D input for troubleshooting Magnetron 2.																																										
7	IN2	IN	Connected to GND.(0V)																																										
8	IN1	IN	Terminal not used.																																										
9	IN0	IN	Temperature measurement input: INTAKE THERMISTOR. By inputting DC voltage corresponding to the temperature detected by the thermistor, this input is converted into temperature by the A/D converter built into the LSI.																																										
10	P47	OUT	Terminal not used.																																										
11	P46	OUT	Memory (EEPROM) clock output.																																										
12	P45	IN/OUT	Memory (EEPROM) data input/output.																																										
13-14	P44-P43	OUT	Magnetron high-voltage circuit driving signal. To turn on and off the cook relay. In 100% power level operation, "L" level during cooking; "H" level otherwise. In other power level operation (90,80,70,60,50,40,30,20,10 or 0%), "H" and "L" level is repeated according to power level. <table border="1" data-bbox="475 1077 1067 1301"> <thead> <tr> <th>Power level</th> <th>ON</th> <th>OFF</th> <th>Power level</th> <th>ON</th> <th>OFF</th> </tr> </thead> <tbody> <tr> <td>100%</td> <td>48sec.</td> <td>0sec.</td> <td>40%</td> <td>22sec.</td> <td>26sec.</td> </tr> <tr> <td>90%</td> <td>44sec.</td> <td>4sec.</td> <td>30%</td> <td>16sec.</td> <td>32sec.</td> </tr> <tr> <td>80%</td> <td>40sec.</td> <td>8sec.</td> <td>20%</td> <td>12sec.</td> <td>36sec.</td> </tr> <tr> <td>70%</td> <td>36sec.</td> <td>12sec.</td> <td>10%</td> <td>8sec.</td> <td>40sec.</td> </tr> <tr> <td>60%</td> <td>32sec.</td> <td>16sec.</td> <td>0%</td> <td>0sec.</td> <td>48sec.</td> </tr> <tr> <td>50%</td> <td>26sec.</td> <td>22sec.</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> 	Power level	ON	OFF	Power level	ON	OFF	100%	48sec.	0sec.	40%	22sec.	26sec.	90%	44sec.	4sec.	30%	16sec.	32sec.	80%	40sec.	8sec.	20%	12sec.	36sec.	70%	36sec.	12sec.	10%	8sec.	40sec.	60%	32sec.	16sec.	0%	0sec.	48sec.	50%	26sec.	22sec.			
Power level	ON	OFF	Power level	ON	OFF																																								
100%	48sec.	0sec.	40%	22sec.	26sec.																																								
90%	44sec.	4sec.	30%	16sec.	32sec.																																								
80%	40sec.	8sec.	20%	12sec.	36sec.																																								
70%	36sec.	12sec.	10%	8sec.	40sec.																																								
60%	32sec.	16sec.	0%	0sec.	48sec.																																								
50%	26sec.	22sec.																																											
15	P42	OUT	Power supply output at thermistor detecting circuit. (Output -5V in cooking only, but apply high impedance to others to prevent thermistor from electrolytic corrosion occurrence.)																																										
16	P41	OUT	Terminal not used.																																										
17	P40	OUT	Oven lamp, Blower motor and Stirrer motor driving signal. (Square Waveform : 50Hz) To turn on and off the shut-off relay (RY1). The Square waveform voltage is delivered to the RY1 relay driving circuit and relays(RY3,RY4,COOK RELAY) control circuit. 																																										
18-22	P37-P33	OUT	Terminal not used.																																										
23	P32	OUT	Signal to sound buzzer. This signal is to control the 2.5kHz continuous signal. A: key touch sound. B: Guydance sound. C: Completion sound. 																																										
24	P31	IN	Signal synchronized with commercial power source frequency. This is basic timing for all time processing of LSI. 																																										
25	P30	OUT	Terminal not used.																																										
26	CNVSS	IN	Connected to Vc.(-5V)																																										

Pin No.	Signal	I/O	Description																												
27	RESET	IN	Auto clear terminal. Signal is input to reset the LSI to the initial state when power is supplied. Temporarily set to "L" level the moment power is supplied, at this time the LSI is reset. Thereafter set at "H" level.																												
28	XIN	IN	Internal clock oscillation frequency setting input. The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to XOUT terminal.																												
29	XOUT	OUT	Internal clock oscillation frequency control output. Output to control oscillation input of XIN.																												
30/31	XCIN/XCOUT	TIN/OUT	Terminal not used.																												
32	VSS	IN	Power source voltage: -5V. VC voltage of power source circuit input.																												
33	∅	OUT	Terminal not used.																												
34	R3	IN	Signal coming from touch key. When either one of G-12 line keys on key matrix is touched, a corresponding signal out of P11, P12, P14-P17 will be input into R3. When no key is touched, the signal is held at "L" level.																												
35	R2	IN	Signal similar to R3. When either one of G-11 line keys on key matrix is touched, a corresponding signal will be input into R2.																												
36	R1	IN	Signal similar to R3. When either one of G-10 line keys on key matrix is touched, a corresponding signal will be input into R1.																												
37	R0	IN	Signal similar to R3. When either one of G-9 line keys on key matrix is touched, a corresponding signal will be input into R0.																												
38	VP	IN	Anode (segment) of Fluorescent Display light-up voltage: -31V Vp voltage of power source circuit input.																												
39	P17	OUT	Segment data signal. The relation between signals and indicators are as follows: <table border="0" style="display: inline-table; vertical-align: top;"> <tr> <td>Signal</td> <td>Segment</td> <td>Signal</td> <td>Segment</td> </tr> <tr> <td>P24</td> <td>..... i</td> <td>P13</td> <td>..... f</td> </tr> <tr> <td>P23</td> <td>..... j,k</td> <td>P12</td> <td>..... e</td> </tr> <tr> <td>P17</td> <td>..... LB</td> <td>P11</td> <td>..... d</td> </tr> <tr> <td>P16</td> <td>..... UB</td> <td>P10</td> <td>..... c</td> </tr> <tr> <td>P15</td> <td>..... h</td> <td>P07</td> <td>..... b</td> </tr> <tr> <td>P14</td> <td>..... g</td> <td>P06</td> <td>..... a</td> </tr> </table> 	Signal	Segment	Signal	Segment	P24 i	P13 f	P23 j,k	P12 e	P17 LB	P11 d	P16 UB	P10 c	P15 h	P07 b	P14 g	P06 a
Signal	Segment	Signal	Segment																												
P24 i	P13 f																												
P23 j,k	P12 e																												
P17 LB	P11 d																												
P16 UB	P10 c																												
P15 h	P07 b																												
P14 g	P06 a																												
			Key strobe signal. Signal applied to touch-key section. A pulse signal is input to R0-R3 terminal while one of G-6 line keys on key matrix is touched.																												
40	P16	OUT	Segment data signal. Signal similar to P17. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to R0-R3 terminal while one of G-5 line keys on key matrix is touched.																												
41	P15	OUT	Segment data signal. Signal similar to P17. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to R0-R3 terminal while one of G-4 line keys on key matrix is touched.																												
42-43	P14-P13	OUT	Segment data signal. Signal similar to P17.																												
44	P12	OUT	Segment data signal. Signal similar to P17. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to R0-R3 terminal while one of G-8 line keys on key matrix is touched.																												
45	P11	OUT	Segment data signal. Signal similar to P17. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to R0-R3 terminal while one of G-7 line keys on key matrix is touched.																												

Pin No.	Signal	I/O	Description														
46	P10	OUT	Segment data signal. Signal similar to P17.														
47-48	P07-P06	OUT	Segment data signal. Signal similar to P17.														
49	P05	OUT	<p>Digit selection signal. The relation between digit signal and digit are as follows:</p> <table border="1"> <tr> <td>Digit signal</td> <td>Digit</td> </tr> <tr> <td>P05</td> <td>1st.</td> </tr> <tr> <td>P04</td> <td>2nd.</td> </tr> <tr> <td>P03</td> <td>3rd.</td> </tr> <tr> <td>P02</td> <td>4th.</td> </tr> <tr> <td>P01</td> <td>5th.</td> </tr> <tr> <td>P00</td> <td>6th.</td> </tr> </table> <p>Normally, one pulse is output in every β period, and input to the grid of the Fluorescent Display.</p>	Digit signal	Digit	P05	1st.	P04	2nd.	P03	3rd.	P02	4th.	P01	5th.	P00	6th.
Digit signal	Digit																
P05	1st.																
P04	2nd.																
P03	3rd.																
P02	4th.																
P01	5th.																
P00	6th.																
50-54	P04-P00	OUT	Digit selection signal. Signal similar to P16.														
55-57	P27-P25	OUT	Terminal not used.														
58-59	P24-P23	OUT	Segment data signal. Signal similar to P17.														
60	P22	OUT	<p>(Sound) Voltage level control terminal. This terminal (P22) is to control volume level of buzzer sound with terminals P21. Since the volume level of buzzer sound depends on voltage energized, it is control level in 3 steps by combining signal levels for P22,P21. Relationship of signal level combination to sound volume level is shown in the following table, 1~3 in the table, however, are indicated in the descending order from the maximum level of sound volume through the minimum level.</p> <table border="1"> <tr> <td>Sound Volume</td> <td>P21</td> <td>P22</td> </tr> <tr> <td>1,(Max.)</td> <td>L</td> <td>L</td> </tr> <tr> <td>2,</td> <td>H</td> <td>L</td> </tr> <tr> <td>3,(Min.)</td> <td>L</td> <td>H</td> </tr> </table> <p>*At Output terminal P32, rectangular wave signal of 2.5kHz is output.</p>	Sound Volume	P21	P22	1,(Max.)	L	L	2,	H	L	3,(Min.)	L	H		
Sound Volume	P21	P22															
1,(Max.)	L	L															
2,	H	L															
3,(Min.)	L	H															
61	P21	OUT	Sound level control signal. Refer to above signal P22.														
62	P20	IN	Input signal which communicates the door open/close information to LSI. Door closed; "H" level signal(0V). Door opened; "L" level signal(-31.0V).														
63/64	AVCC/VCC	IN	Connected to GND.														

2-2 Memory IC (IC2)

AT24C04 is a 4K-bit, serial memory, enabling CMOS to be erased/written electrically. This memory is constructed with 512 registers x 8bits, enabling individual access, read and write operations to be performed. Details of input/output signal for IC2 are as shown in the following diagram.

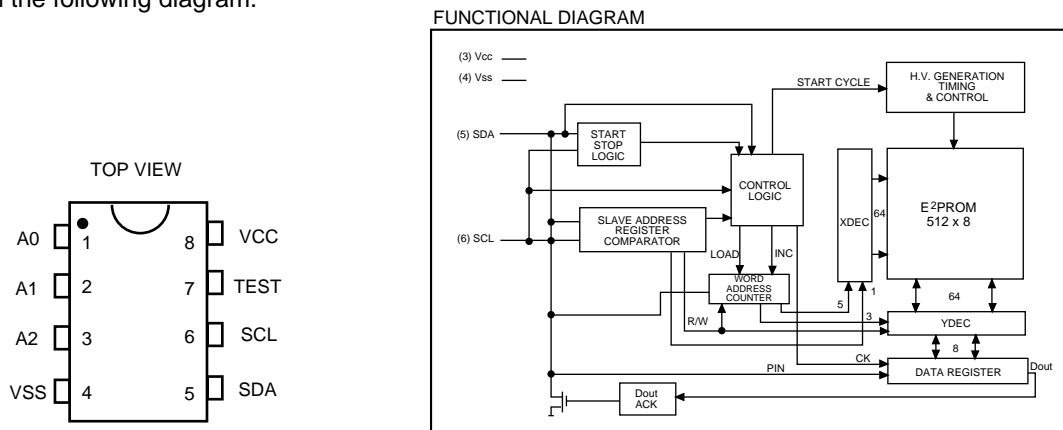


Figure T-4 Relation between Pin Nos, and Signals

Pin No.	Signal	I/O	Description
1-3	A0-A2	IN	Connected to GND.
4	VSS	IN	Connected to VC(-5V).
5	SDA	IN/OUT	Serial data input/output : input/outputs data to IC1.
6	SCL	IN	Clock signal input : input/outputs serial data at every one pulse.
7	TEST	IN	Connected to VC(-5V).
8	VCC	IN	Connected to GND.

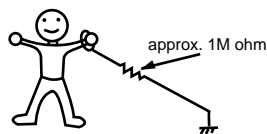
SERVICING

1. Precautions for Handling Electronic Components

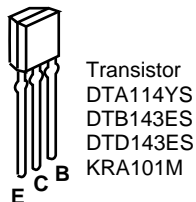
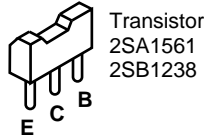
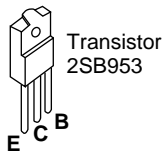
This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc, and sometimes it is not fully protected by the built-in protection circuit.

In order to protect CMOS LSI.

- 1) When storing and transporting, thoroughly wrap them in aluminium foil. Also wrap all PW boards containing them in aluminium foil.
- 2) When soldering, ground the technician as shown in the figure and use grounded soldering iron and work table.



2. Shapes of Electronic Components



3. Servicing of Touch Control Panel

We describe the procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so. To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.

- (1) Servicing the touch control panel with power supply of the oven:

CAUTION: THE HIGH VOLTAGE TRANSFORMER OF THE MICROWAVE OVEN IS STILL LIVE DURING SERVICING PRESENTS A HAZARD.

Therefore, when checking the performance of the touch control panel, put the outer cabinet on the oven to avoid touching the high voltage transformer, or unplug the primary terminal (connector) of the high voltage transformer to turn it off; the end of such connector must be insulated with an insulating tape. After servicing, be sure to replace the leads to their original locations.

- A. On some models, the power supply cord between the touch control panel and the oven itself is so short that the two can't be separated. For those models, check and

repair all the controls (sensor-related ones included) of the touch control panel while keeping it connected to the oven.

- B. On some models, the power supply cord between the touch control panel and the oven proper is long enough that they may be separated from each other. For those models, therefore, it is possible to check and repair the controls of the touch control panel while keeping it apart from the oven proper; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which brings about an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if dummy resistor(s) with resistance equal to that of the controls are used.

- (2) Servicing the touch control panel with power supply from an external power source:

Disconnect the touch control panel completely from the oven proper, and short both ends of the door sensing switch (on PWB) of the touch control panel, which brings about an operational state that is equivalent to the oven door being closed. Connect an external power source to the power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel it is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

4. Servicing Tools

Tools required to service the touch control panel assembly.

- 1) Soldering iron: 30W
(It is recommended to use a soldering iron with a grounding terminal.)
- 2) Oscilloscope: Single beam, frequency range: DC-10MHz type or more advanced model.
- 3) Others: Hand tools

5. Other Precautions

- 1) Before turning on the power source of the control unit, remove the aluminium foil applied for preventing static electricity.
- 2) Connect the connector of the key unit to the control unit being sure that the lead wires are not twisted.
- 3) After aluminium foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
- 4) Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
- 5) Be sure to use specified components where high precision is required.

PROCEDURE FOR CHECKING/CLEARING SERVICE COUNTS OF MICROWAVE OVEN

The following procedure enables the servicer to obtain the total service counts (cook cycles) for memory cooking, double quantity cooking and defrost. The maximum capacity of the counter is 999,999 counts, above which the counter will reset to "0". The counter will retain the total counts (will not clear) in the event of a power disruption.

1) Practice for checking total service counts (eg; 234,567 Counts).

... flashing / ○ ... 0.1sec BUZZER

PAD	DISPLAY	INDICATOR	LED	PHONE
(Door close)	.			
CHECK	NUMBER .	CHECK		○
CHECK	#1 82 68 (user total count)	CHECK		○
#2 VOLUME VOLUME DOUBLE QUANTITY	2 34 56 7 (service total count)			○
	1 NUMBER 1 (after 1 sec.)			○
	45 (filter used time)			
2	NUMBER 2 (after 1 sec.)			○
	2 00 (filter lim. time)			
0 (No 10)	NUMBER 10 (after 1 sec.)			○
	35 43 2 (service total cook time)			
CHECK	.			○

#1: Denotes total service counts within the reach of user, of which checking and clearing practices are described in this instruction manual.

#2: Denotes the procedure for the servicer to disable checking/clearing. This procedure is instructed to service personnel only and is excluded from the operation manual.

2) Practice for clearing Service's counts

" " : Flicker / ○ : 0.1 sec BUZZER

PAD ORDER	DISPLAY	PHONE
(Door close)	.	
CHECK	"NUMBER" .	○
CHECK	82 68 "CHECK" (User's Total Counts)	○
#1 VOLUME	82 68 "CHECK"	
VOLUME	82 68 "CHECK"	
DOUBLE QUANTITY	2 34 56 7 "CHECK" (Total Counts of Service)	○
SET	0 "CHECK"	○
0	0 "CHECK"	○
SET	0 "CHECK"	○
CHECK	.	○

#1: Denotes the procedure for the servicer to disable clearing. This procedure is instructed to service personnel only and is excluded from the operation manual.

PROCEDURE FOR ENTERING TO IC-2

When the control unit or IC-2 is exchanged, re-enter the constants of DEFROST and the memory pads 1~20, referring to items 1 and 2 below.

1) How to enter the contents of DEFROST

$$T = STG1 + STG2 + STG3$$

$$STG = A \times T + B$$

1 stage 10% power level

" " : Flicker / ○ : 0.1 sec BUZZER

PAD ORDER	DISPLAY	PHONE
(Door close)	.	
SET	.	
SET (within 2 sec.)	"NUMBER" .	○
#1 START	"NUMBER" .	
DEFROST	1 0.00 DEF	○
9,9	1 0.99 DEF (A)	○ x 2
SELECTATIME	1 0 DEF	○
9	1 90 DEF #2 (+ - B)	○
SELECTAPOW	DEF "POWER" 1 90 100%	○
1	DEF "POWER" 90 10%	○
SELECTATIME	2 0.00 DEF	○
0	2 0.00 DEF (A)	○
SELECTATIME	2 0 DEF	○
0	2 0 DEF (+ - B)	○
SELECTATIME	3 0 DEF	○
START	3 A DEF	○
SET	4 . DEF	○
SET	.	○

#1 : No key entry signal.

#2 : To set-B, touch the selectapower key twice.

2) How to enter the memory information

Example : Suppose cooking time 5 sec. and output power 100% are entered into the memory pad 1.

PAD ORDER	DISPLAY	PHONE
(Door close)	.	
SET	.	
SET (within 2 sec.)	"NUMBER" .	○
1	NUMBER 1 . 0	○
5	NUMBER 1 . 5	○
SET	"NUMBER" .	○
SET	.	○

Enter the memory information into the memory pads 1 ~10 referring to above example. The memory information are given below.

Memory No.	Cook Time	Output Power
1	5 sec.	100%
2	10 sec.	100%
3	20 sec.	100%
4	30 sec.	100%
5	40 sec.	100%
6	50 sec.	100%
7	1 min.	100%
8	1 min. 15 sec.	100%
9	1 min. 30 sec.	100%
10	2 min.	100%
11-20	0 sec.	

Enter the memory information of magnification of double into the memory pads 1 ~ 20 (all 1.80).

Ex, To set memory 1

PAD ORDER	DISPLAY	PHONE
SET	.	
SET	"NUMBER" .	○
DOUBLE	"NUMBER" . DOUBLE	○
1	NUMBER 1 0.00 DOUBLE	○
1,8,0	NUMBER 1 1.80 DOUBLE	○ x 3
SET	"NUMBER" . DOUBLE	○
SET	.	○

OTHER CHECKING AND CLEARING PROCEDURE

1) To check the contents of defrost.

" " : Flicker / ○ : 0.1 sec BUZZER

PAD ORDER	DISPLAY	PHONE
(Door close)	.	
CHECK	"NUMBER" . CHECK	○
DEFROST	1 0.99 DEF CHECK (A)	○
	DEF CHECK 1 90 POWER (+ - B)	
	2 0.00 DEF CHECK (A)	
	DEF CHECK 2 0 POWER (+ - B) 100%	
	DEF CHECK 3 A POWER 100%	
	(Repeat)	
CHECK	.	○

#1 : No key entry signal.

2) How to clear all counter(user and service) and total cooking time and used time of filter.

PAD ORDER	DISPLAY	PHONE
(Door close)	.	
SET	.	
SET	"NUMBER" .	○
DOUBLE	"NUMBER" . DOUBLE	○
CHECK	"NUMBER" . DOUBLE	
VOLUME	"NUMBER" . DOUBLE	
SET	.	○

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

WARNING: Avoid possible exposure to microwave energy. Please follow the instructions below before operating the oven.

1. CARRY OUT 3D CHECKS.
2. Make sure that a definite "click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position, then pull the door release lever with one hand, this causes the latch leads to rise, it is then possible to hear a "click" as the door switches operate.)
3. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).

Carry out any remedial work that is necessary before operating the oven.

Do not operate the oven if any of the following conditions exist;

1. Door does not close firmly.
2. Door hinge, support or latch hook is damaged.
3. The door gasket or seal or damaged.
4. The door is bent or warped.
5. There are defective parts in the door interlock system.
6. There are defective parts in the microwave generating and transmission assembly.
7. There is visible damage to the oven.

Do not operate the oven:

1. Without the RF gasket (Magnetron).
2. If the wave guide or oven cavity are not intact.
3. If the door is not closed.
4. If the outer case (cabinet) is not fitted.

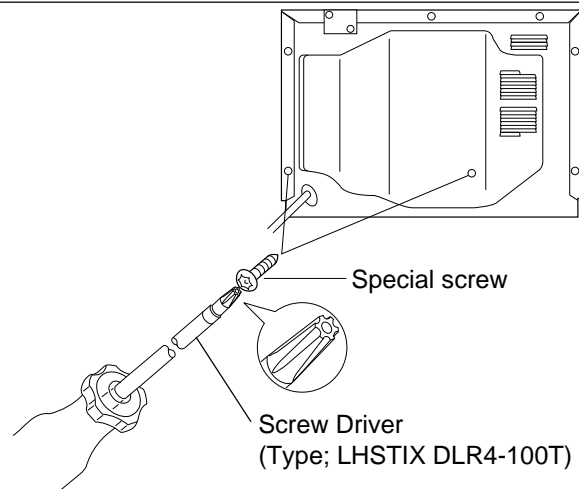
Please refer to 'OVEN PARTS, CABINET PARTS, DOOR PARTS', when carrying out any of the following removal procedures:

OUTER CASE REMOVAL

To remove the outer case, proceed as follows.

1. Disconnect oven from power supply.
 2. Open the oven door and wedge it open.
 3. Remove the two (2) screws from the lower portion of the rear cabinet and lower left portion of the oven cabinet back side using by special screw drive (Type; LHSTIX DLR4-100T).
 4. Remove the screws from rear and along the side edge of case.
 5. Slide the entire case back about 3cm to free it from retaining clips on the cavity face plate.
 6. Lift the entire case from the oven.
 7. Remove the screws holding the rear cabinet to the oven.
 8. Remove the rear cabinet.
 9. Discharge the HV capacitor before carrying out any further work.
 10. Do not operate the oven with the outer case removed.
- N.B.; Step 1,2 and 9 form the basis of the 3D checks.

CAUTION: DISCHARGE HIGH VOLTAGE CAPACITOR BEFORE TOUCHING ANY OVEN COMPONENTS OR WIRING.



HIGH VOLTAGE COMPONENTS REMOVAL (High Voltage Capacitor and High Voltage Rectifier Assembly)

To remove the components, proceed as follows.

1. CARRY OUT 3D CHECKS.
2. Remove two (2) screws holding earth side terminals of high voltage rectifier assemblies.
3. Disconnect all the leads and terminals of high voltage rectifier assembly from high voltage capacitor.
4. Remove two (2) screws holding capacitor holder to the right side of oven cavity and remove the capacitor holder.
5. Now, high voltage rectifier assembly should be free.

CAUTION

1. DO NOT REPLACE ONLY HIGH VOLTAGE RECTIFIER. WHEN REPLACE IT, REPLACE HIGH VOLTAGE RECTIFIER ASSEMBLY.
2. WHEN REPLACING HIGH VOLTAGE RECTIFIER ASSEMBLY, ENSURE THAT THE CATHODE (EARTH) CONNECTION IS SECURELY FIXED TO THE CHASSIS WITH A EARTHING SCREW.
6. Now, the two (2) high voltage capacitors are free.

MAGNETRON REMOVAL

1. Remove the outer case cabinet referring to "OUTER CASE REMOVAL" and CARRY OUT 3D CHECKS.
2. Remove the eleven (11) screws holding the rear cabinet to the oven cavity.
3. Disconnect the power supply cord from the noise filter.
4. Remove the one (1) screw holding the earth wire of the power supply cord to the noise filter angle.
5. Remove the rear cabinet with the power supply cord from the oven cavity.
6. Remove the two (2) screws holding the magnetron exhaust duct to upper and lower waveguide.
7. Disconnect all the wire leads from the two (2) magnetrons.
8. Carefully remove each four (4) screws holding each two (2) magnetrons to waveguide. When removing the screws hold the magnetron to prevent it from falling.
9. Remove the magnetron from the waveguide with care so the magnetron antenna is not hit by any metal object around the antenna.
10. Now, the magnetron is free.

CAUTION: WHEN REPLACE THE MAGNETRON, BE SURE THE R.F. GASKET IS IN PLACE AND THE MAGNETRON MOUNTING SCREWS TIGHTENED SECURELY.

HIGH VOLTAGE TRANSFORMER REMOVAL

1. Remove the outer case cabinet referring to "OUTER CASE REMOVAL" and CARRY OUT 3D CHECKS.
2. Disconnect the all wire leads from the magnetron(s).
3. Remove the wire holder holding the high voltage wires.
4. Disconnect all wire leads from the high voltage transformer(s).
5. Remove the each two (2) screws holding each high voltage transformer.
6. Now, high voltage transformer(s) is (are) free.

BLOWER MOTOR REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the wire leads from the blower motor and the blower motor thermal cut-out.
3. Remove the one (1) screw holding the blower motor to the oven cavity.
4. Remove the one (1) screw holding the blower motor to the chassis support.
5. Remove the blower motor. Now, the blower motor is free.

STIRRER MOTOR (UPPER) REMOVAL

1. Remove the outer case cabinet referring to "OUTER CASE REMOVAL" and CARRY OUT 3D CHECKS.
2. Disconnect the wire leads from the stirrer motor (upper).
3. Remove the one (1) screw holding the stirrer motor (upper) to the oven cavity.
4. Turn and lift up the stirrer motor (upper).
5. Now, the stirrer motor (upper) is free.

STIRRER MOTOR (LOWER) REMOVAL

1. Disconnect oven from the power supply.
2. Remove the stirrer motor cover by snipping off the material in four portions.
3. Where the portions have been snipped off bend the portions flat. No sharp edge must be evident after removal of the stirrer cover.
4. Disconnect wire leads from the stirrer motor. (See "Positive lock connector removal")
5. Remove one (1) screw holding the stirrer motor to oven cavity.
6. Now, the stirrer motor (lower) is free.
7. After replacement use the one (1) screw to fit the stirrer motor cover. (This screw has been fitted to the base plate near the stirrer motor cover beforehand.)

OVEN LAMP SOCKET REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the oven lamp.
3. Pull the wire leads from the oven lamp socket by pushing the terminal hole of the oven lamp socket with the flat type small screw driver.
4. Lift up the oven lamp socket.
5. Now, the oven lamp socket is free.

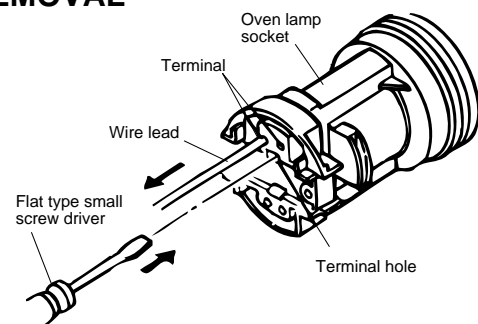


Figure C-1. Oven lamp socket

CONTROL PANEL ASSEMBLY AND CONTROL UNIT REMOVAL

CONTROL PANEL ASSEMBLY REMOVAL

The complete control panel should be removed for replacement of components. To remove the control panel, proceed as follows:

1. CARRY OUT 3D CHECKS.
2. Remove the air intake filter assembly from the base plate.
3. Remove two (2) screws holding the control panel to the base plate.
4. Pull down the control panel and remove it forward.
5. Disconnect two connectors (A), (B), (D), (H) and TAB terminal (TAB1,2,3,4) from the control unit.
6. Now the control panel assembly is free.

CAUTION FOR TOUCH CONTROL PANEL REMOVAL

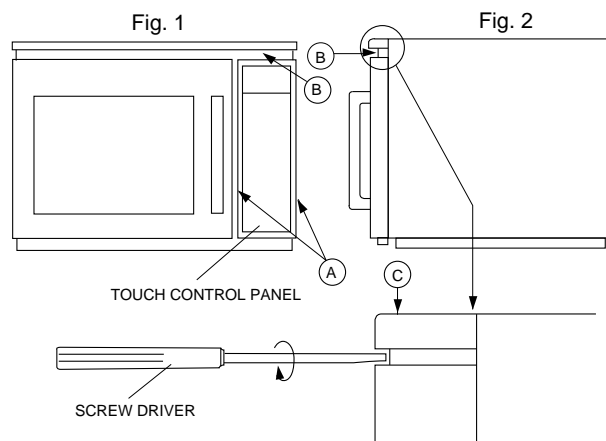
- 1) Hold the lower end (Position A, Fig. 1) of the touch control panel assembly firmly while sliding it down and toward you.

DO NOT FORCE THE CONTROL UNIT TO SLIDE DOWN DURING REMOVAL. THIS MAY CAUSE DAMAGE TO THE CONTROL UNIT BY HITTING A RELAY (RY-4) OR THE TAB TERMINALS LOCATED AT THE FRONT OF THE OVEN CAVITY.

- 2) If the Touch Control Panel is hard to remove;
 - (1) Insert a flat head screw driver into space B . (Fig. 1)
 - (2) Rotate the screwdriver clockwise while holding position C of the Touch Control Panel. (Fig. 2)

TO AVOID DAMAGE TO TOUCH CONTROL PANEL, COVER THE TIP OF SCREWDRIVER WITH TAPE.

- (3) Re-solder the Relay (RY-4) prior to reinstalling the Touch Control Panel.



HOW TO RELEASE THE POSITIVE LOCK® CONNECTOR.

Procedure

1. Pushing the lever of positive lock® connector.
2. Pull down the connector from the terminal.
3. Now, the connector is free.

Note: If the positive lock® has a insulation sleeve, first remove it. If you do not so, you can not push the lever of positive lock®.

CAUTION: The positive lock® terminal can not be disconnected by only pulling. Because once you (Service personnel) have connected the positive lock® connector to the terminal, the positive lock® connector has been locked.

Replacement of individual component is as follows:

CONTROL UNIT AND CONTROL PANEL FRAME (WITH KEY)

7. Remove two (2) screws holding the control panel mounting angle to the panel frame.
8. Lift up the control panel mounting angle from the panel frame.
9. Disconnect connector (G) from the control unit by pushing the hooks of cable holder inwardly.
10. Remove four (4) screws holding the control unit to the panel frame assembly.
11. Push down the right side two (2) hooks fixing the control unit to the panel frame assembly, and lift up the control unit upward.
12. Now, the control unit and control panel frame (with key) are free.

CAUTION:

At installing control panel unit assembly to main body set:

1. Ensure the installation of wiring-related parts without negligence.
2. When inserting key cable to main body set, ensure them free from caught-in trouble. In addition, when installing the control panel assembly to base plate with screws, be sure of pushing the control panel unit upward to fix with screws firmly.
3. Do not allow any wire leads to come near the varistor works, because it will explode and the wire leads near by the varistor will be damaged.

NOTE: 1. Before attaching a new key unit, remove remaining adhesive on the control panel frame surfaces completely with alcohol.

2. When attaching the key unit to the control panel frame, adjust the upper edge and right edge of the key unit to the correct position of control panel frame.
3. Stick the key unit firmly to the control panel frame by rubbing with soft cloth not to scratch.

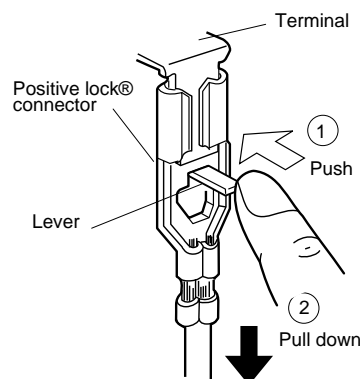


Figure C-2. How to release the positive lock connector.

POWER SUPPLY CORD REPLACEMENT

1. CARRY OUT 3D CHECKS
2. Release the cord bushing from the rear cabinet.
3. Disconnect the brown and blue wires of the power supply cord from the noise filter.
4. Loosen the single (1) screw holding the earth angle and earth wire of power supply cord.
5. Remove the power supply cord.
4. Re-install the cord bushing to the rear cabinet.
5. Re-install the rear cabinet to oven cavity and the bottom plate with the eleven (11) screws and two (2) washers.
6. CARRY OUT 4R CHECKS.

CAUTION: DO NOT ALLOW THE WIRE LEADS OF THE POWER SUPPLY CORD TO COME NEAR THE HIGH VOLTAGE TRANSFORMER. BECAUSE THE HIGH VOLTAGE TRANSFORMER BECOMES HOT.

Re-install

1. Insert the power supply cord into the cord bushing.
2. Connect the brown and blue wires of power supply cord into the terminals of noise filter, referring to pictorial diagram.
3. Insert the green/yellow wire of power supply cord into the earth angle, and tight the screw holding the earth angle.

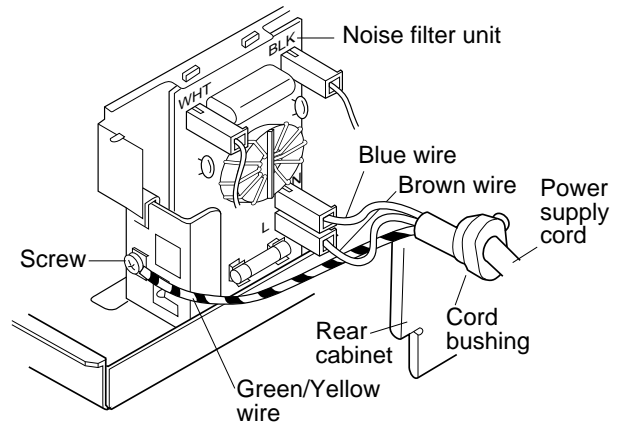


Figure C-3. Power supply cord replacement

1ST LATCH, 2ND LATCH, 3RD LATCH, MONITOR, AND STOP SWITCHES REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the control panel from the oven cavity referring to "CONTROL PANEL REMOVAL".
3. Remove the two (2) screws holding the latch hook to the oven cavity.
4. Open the door and pull the latch hook out of the oven cavity.
5. For 1st latch, 2nd latch or Monitor switch removal
 - 5-1. Disconnect the wire leads from the switch.
 - 5-2. Push the retaining tabs outward slightly and then pull the switch forwards and remove it from the latch hook.
6. For 1st latch and stop switches removal
 - 6-1. Disconnect the wire leads from the 1st latch and stop switches.
 - 6-2. Remove the single (1) screw and nut holding the 1st latch and stop switches to the latch hook.

CAUTION: WHEN THE 1ST LATCH SWITCH AND 2ND. LATCH SWITCH ARE INSTALLED, THE TWO (2) TABS OF THE LATCH HOOK SHOULD BE BROKEN.

1ST, 2ND, 3RD LATCH SWITCH, STOP SWITCH AND MONITOR SWITCH ADJUSTMENT

In case 1st latch switch, 2nd latch, stop switch, 3rd latch switch and monitor switch do not operate properly due to a mis-adjustment, the following adjustment should be made.

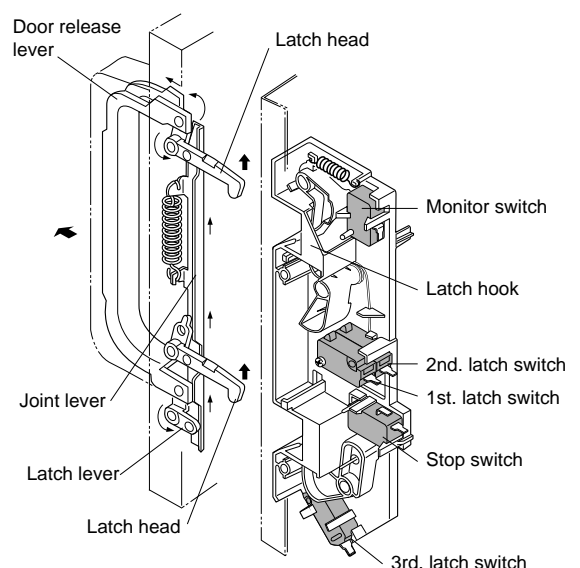
1. Loosen the two (2) screws holding the latch hook.
2. With the door closed, adjust the latch hook by moving it back and forward, or up and down. In and out play of the door allowed by the latch hook should be less than 0.5mm. The vertical position of the latch hook should be placed where the stop switch and 1st, 2nd, 3rd latch switches have activated with the door closed. The horizontal position of the latch hook should be placed where the monitor switch has activated with the door closed.
3. Secure the screws with washers firmly.
4. Make sure of the 1st, 2nd, 3rd latch switches, stop switch, and monitor switch operation. If those switches have not activated with the door closed, loose two (2) screws holding latch hook and adjust the latch hook position.

After adjustment, make sure of the following:

1. The stop switch and 1st, 2nd, 3rd latch switches interrupt the circuit before the door open when the door release lever is pulled, and then and monitor switch close the

circuit when the door is opened.

2. Re-install outer case and check for microwave leakage around the door with an approved microwave survey



meter. (Refer to Microwave Measurement Procedure.)

Figure C-4 Latch Switch Adjustments

DOOR REPLACEMENT AND ADJUSTMENT

DOOR REPLACEMENT

1. CARRY OUT 3D CHECKS.
2. Remove four (4) screws holding the upper and lower oven hinge to the oven cavity.
3. Remove door assembly with upper and lower oven hinges by pulling it forward.
4. On re-installing new door assembly, secure the upper and lower oven hinges with the four (4) mounting screws to the oven cavity. Make sure the door is parallel with bottom line of the oven face plate and the latch head pass through the latch holes correctly.
5. CARRY OUT 4R CHECKS.

Note: After any service to the door, the approved microwave survey meter should be used to assure in compliance with proper microwave radiation standards. (Refer to Microwave Measurement Procedure.)

DOOR ADJUSTMENT

When removing and/or loosening hinges such as in door replacement, the following adjustment criteria are taken. Door is adjusted to meet the following three conditions by keeping screws of hinge loose.

1. Adjust door latch heads at a position where they smoothly catch the latch hook through the latch holes. Refer to latch switch adjustments.
2. Deviation of the door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. The door is positioned with its face depressed toward the cavity face plate.
4. Reinstall outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

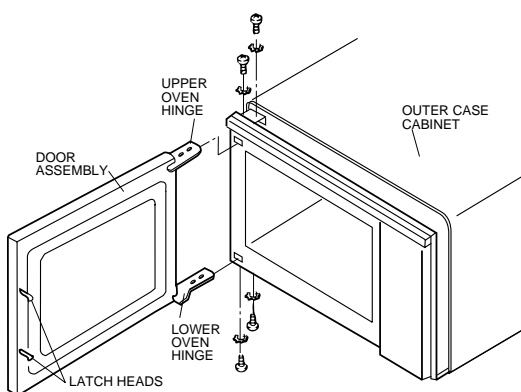


Figure C-5. Door Assembly Replacement and Adjustment

CHOKE COVER REMOVAL

1. Insert an iron plate (thickness of about 0.5mm or flat type screw driver to the gap between the choke cover and door panel as shown figure to free the engaging part. The protect sheet may be used not to damage the door panel.
2. Lift up the choke cover, now cove is free.

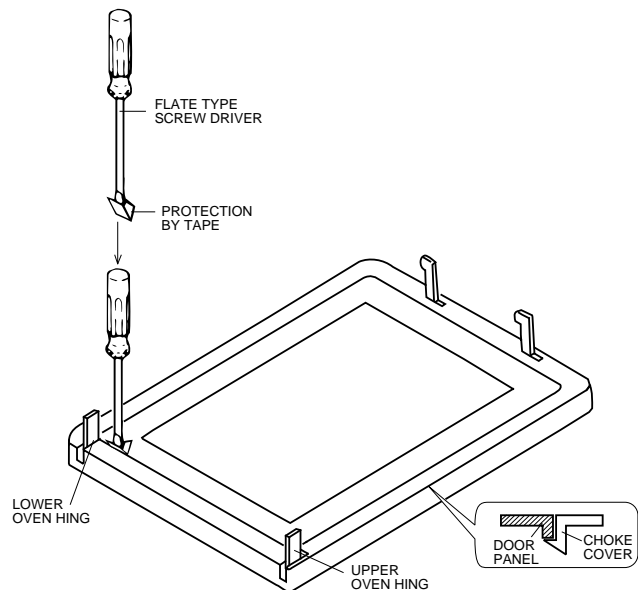


Figure C-6. Choke Cover Removal

DOOR COMPONENTS REMOVAL

Remove the door assembly, referring to from item 1 through item 3 of "DOOR REPLACEMENT".

1. Place the door assembly on a soft cloth with facing up.

(UPPER AND LOWER OVEN HINGE REMOVAL)

2. Remove the choke cover, referring to "CHOKE COVER REMOVAL".
3. Release the oven hinges from the door panel.
4. Now, the oven hinges are free.

(DOOR HANDLE REMOVAL)

5. Remove the two (2) screws holding the door handle to door.
6. Remove the door handle from the door panel.

(UPPER AND LOWER LATCH HEADS REMOVAL)

7. Remove the door release lever from the door assembly.
8. Remove the three (3) screws holding the joint plate to the door panel.
9. Release the latch spring from the tab of the joint lever and joint plate.
10. Release the latch heads from joint lever and joint plate.
11. Now, the latch heads are free.

(DOOR FRAME REMOVAL)

12. Set the four (4) tabs of the door frame upright.
13. Remove the door frame from the door panel. Now, door frame is free.

(DOOR GLASS REMOVAL)

14. Remove the four (4) screws holding the two (2) outside window fixing plates to the door panel.
15. Now, the door glass is free.

SERVICE INFORMATION

IMPORTANT: When replace the magnetron MG1 and/or MG2, the relays RY3 and RY4 on control unit must be replaced at the same time. Because if the magnetron's life has been over, the relay's life may also be over.

MICROWAVE MEASUREMENT

After adjustment of door latch switches, monitor switch and door are completed individually or collectively, the following leakage test must be performed with a survey instrument and it must be confirmed that the result meets the requirements of the performance standard for microwave oven.

REQUIREMENT

The safety switch must prevent microwave radiation emission in excess of $5\text{mW}/\text{cm}^2$ at any point 5cm or more from external surface of the oven.

PREPARATION FOR TESTING:

Before beginning the actual test for leakage, proceed as follows;

1. Make sure that the test instrument is operating normally as specified in its instruction booklet.
Important:
Survey instruments that comply with the requirement for instrumentations as prescribed by the performance standard for microwave ovens must be used for testing.

Recommended instruments are:

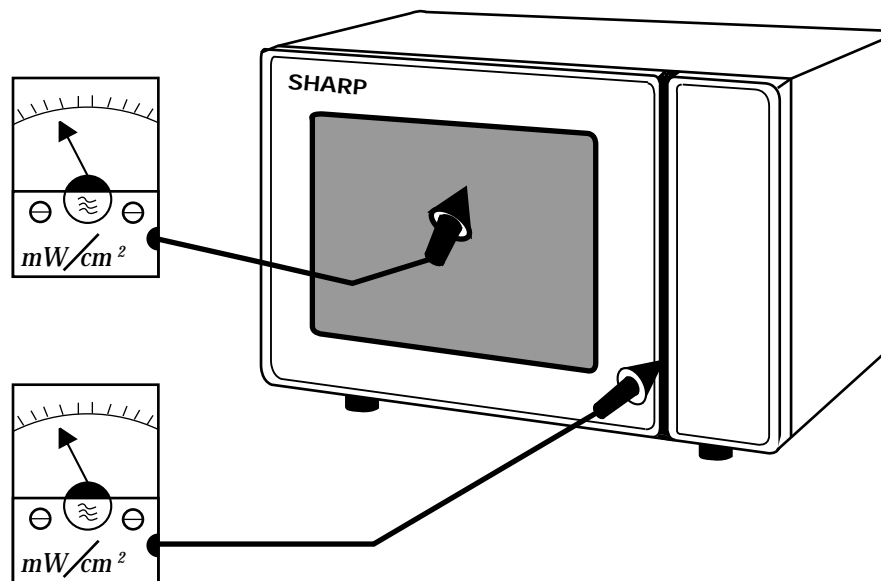
NARDA 8100

NARDA 8200

HOLADAY HI 1500

SIMPSON 380M


2. Place the oven tray into the oven cavity.
3. Place the load of $275 \pm 15\text{ml}$ of water initially at $20 \pm 5^\circ\text{C}$ in the centre of the oven tray. The water container should be a low form of 600 ml beaker with inside diameter of approx. 8.5cm and made of an electrically non-conductive material such as glass or plastic.
The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
4. Close the door and turn the oven ON with the timer set for several minutes. If the water begins to boil before the survey is completed, replace it with 275ml of cool water.
5. Move the probe slowly (not faster than 2.5cm/sec.) along the gap.
6. The microwave radiation emission should be measured at any point of 5cm or more from the external surface of the oven.



Microwave leakage measurement at 5 cm distance

SCHMATIC

NOTE: CONDITION OF OVEN

1. DOOR CLOSED
2.  APPEARS ON DISPLAY

NOTE: "*" INDICATES COMPONENTS WITH POTENTIALS ABOVE 250V.
C1 and C2: 1.07µF/ AC 2100V

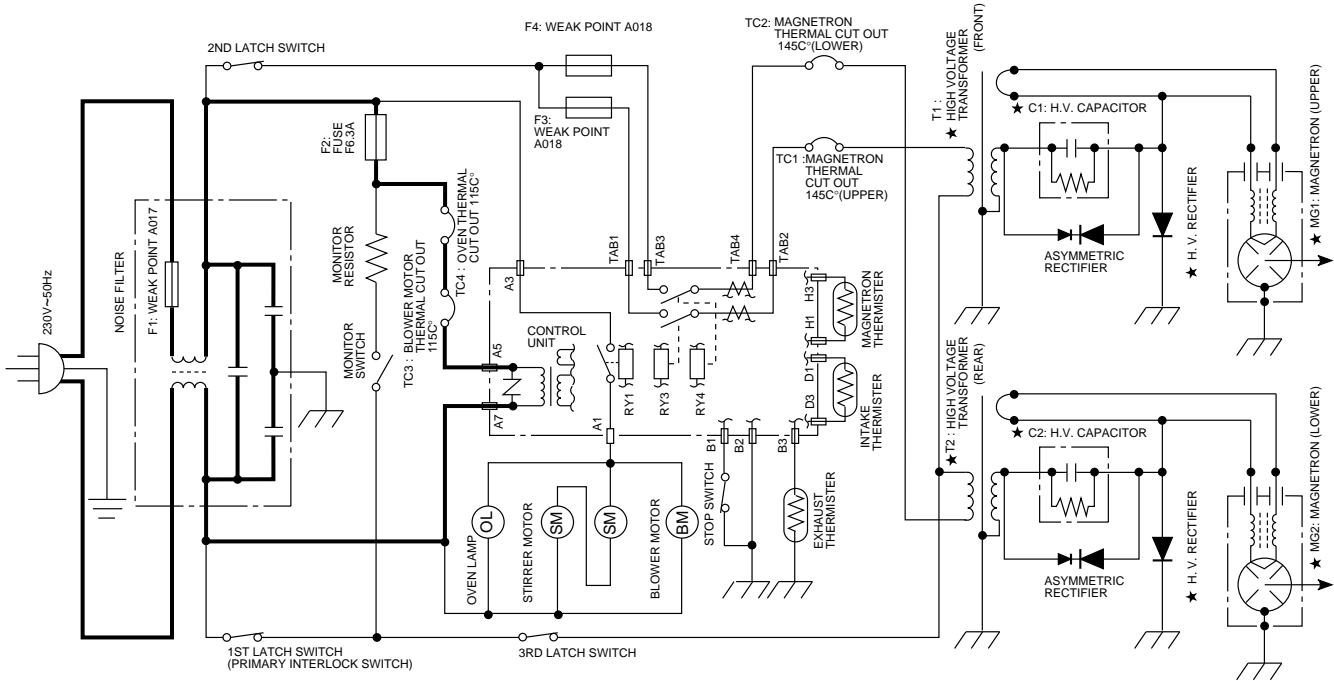


Figure O-1. Oven Schematic-OFF Condition

SCHMATIC

NOTE: CONDITION OF OVEN

1. DOOR CLOSED.
2. TIME KEY TIUCHED.
3. COOKING TIME PROGRAMMED.
4. START KEY TOUCHED

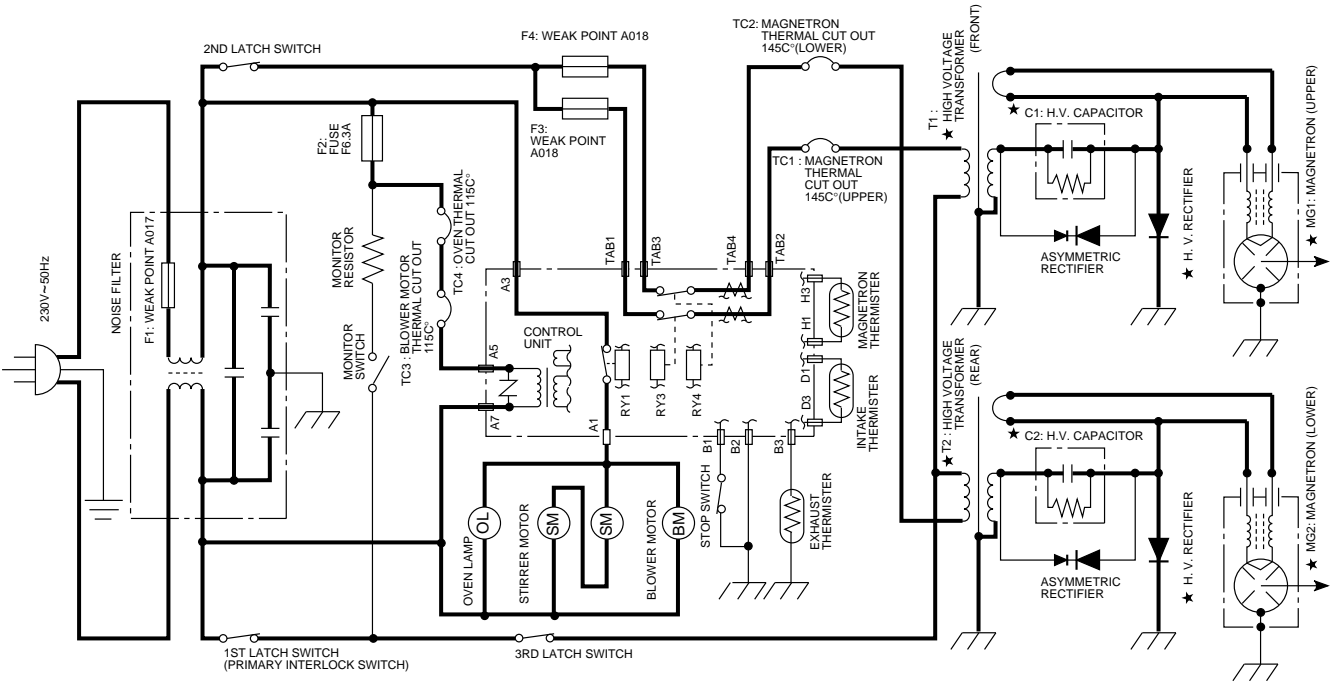


Figure O-2. Oven Schematic-ON Condition

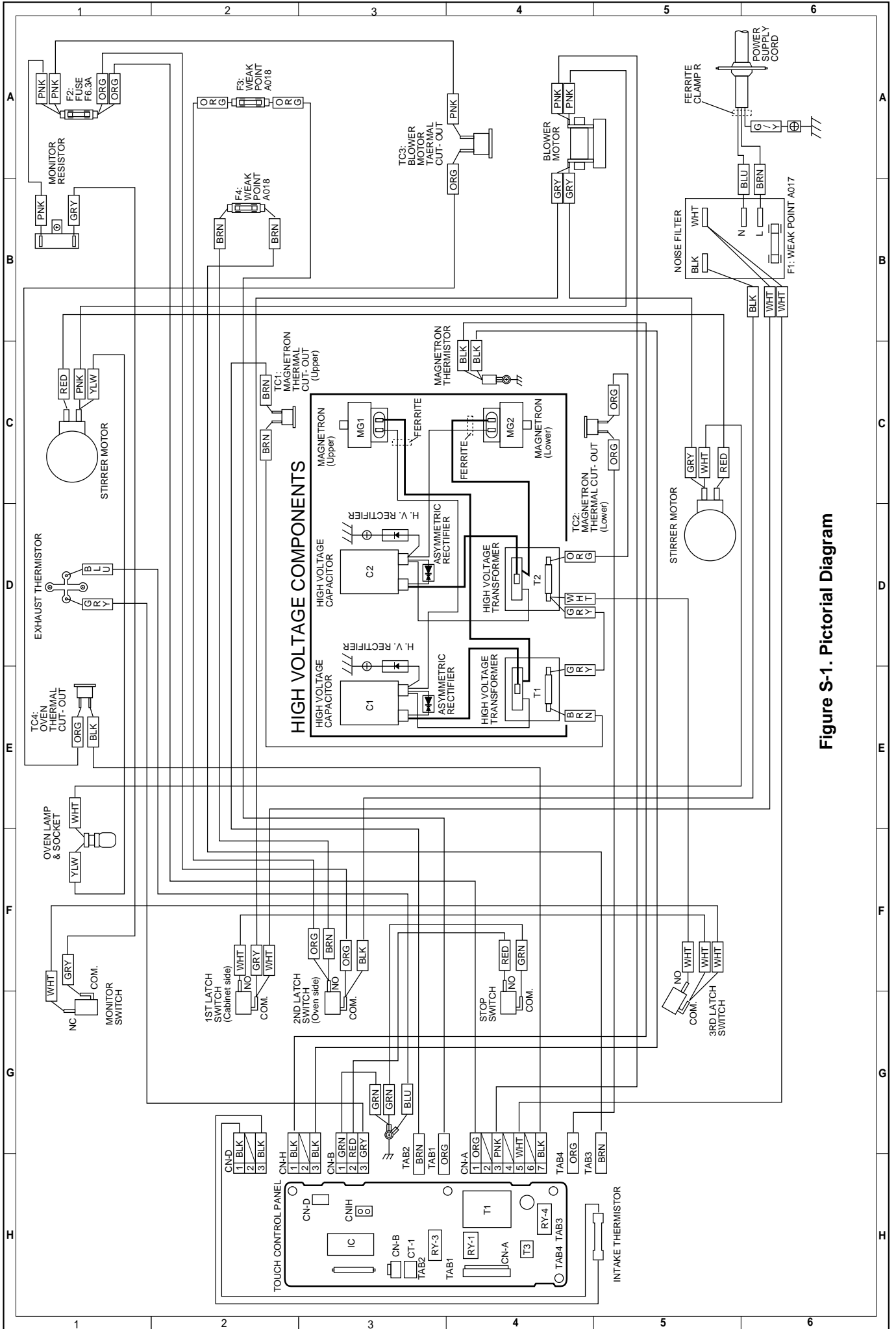


Figure S-1. Pictorial Diagram

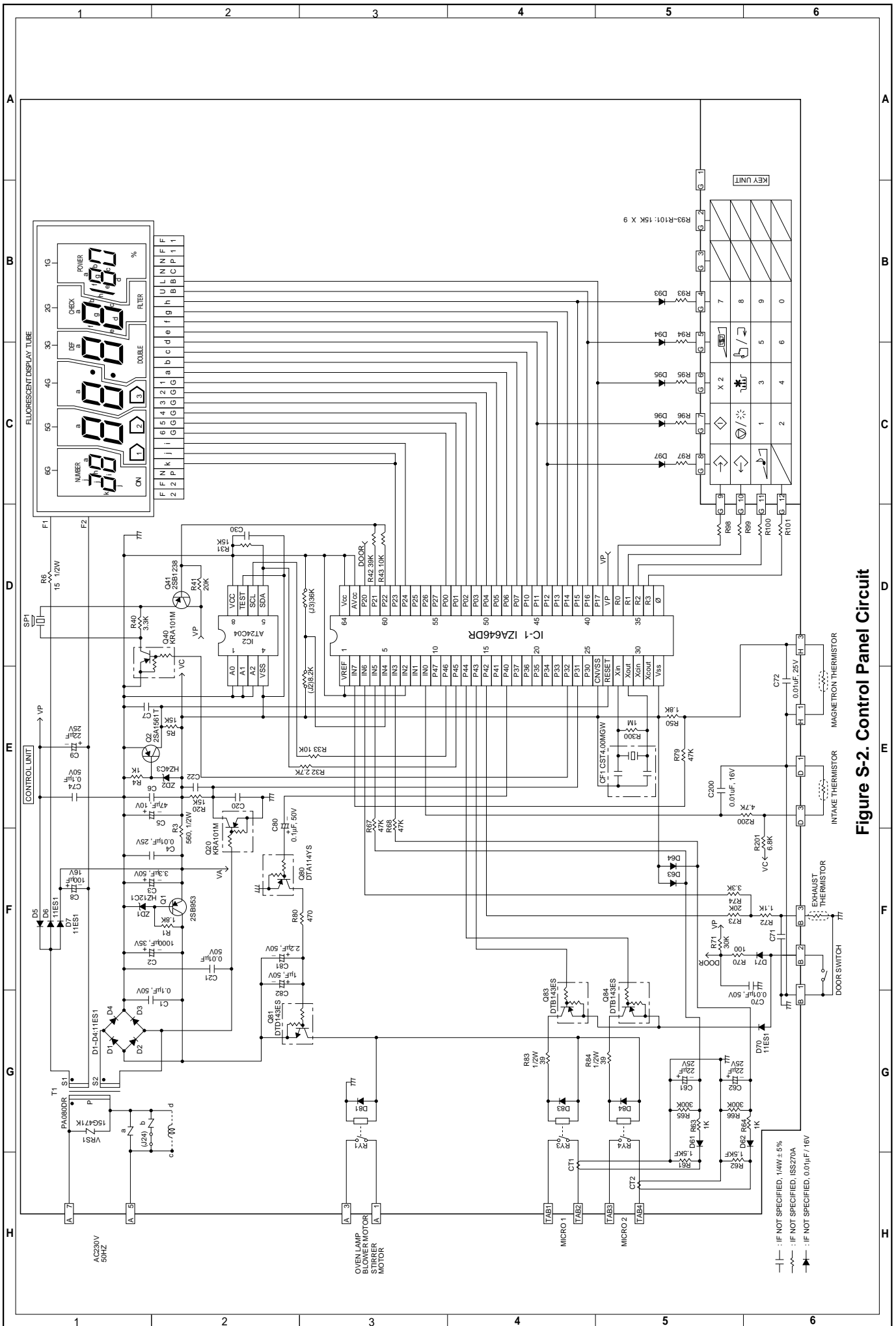


Figure S-2. Control Panel Circuit

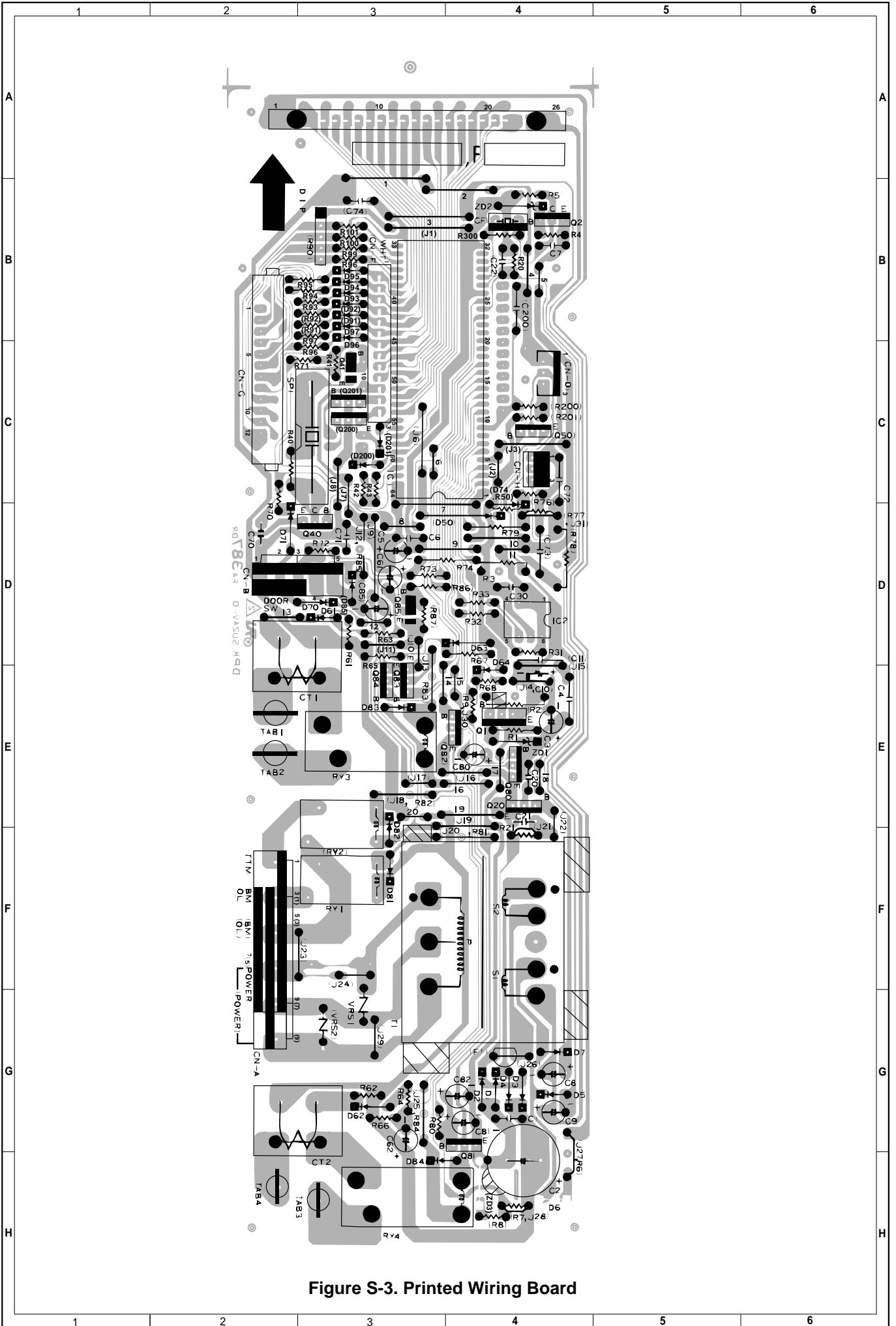


Figure S-3. Printed Wiring Board

PARTS LIST

**Note: The parts marked "Δ" may cause undue microwave exposure.
The parts marked "*" are used in voltage more than 250V.**

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
----------	----------	-------------	------	------

ELECTRIC PARTS

1- 1	FH-HZA050WRE0	Magnetron thermistor	1	AP
1- 2	QSOCLA011WRE0	Oven lamp socket	1	AH
1- 3	FH-HZA049WRE0	Intake thermistor	1	AL
1- 4	FPWBFA296WRE0	Noise filter	1	AW
1- 5	QFSDHA019WRE0	Fuse holder	3	AH
1- 6	QACCVA066WRE0	Power supply cord for European continental use	1	BG
1- 7	DH-HZA009WRK0	Exhaust thermistor	1	AP
* 1- 8	FW-QZA106WRK0	High voltage rectifier assembly	1	BB
1- 9	RTHM-A091WRE0	Oven thermal cut-out 115°C	1	AK
1-10	QSW-MA085WRE0	Stop switch	1	AF
1-11	QSW-MA086WRE0	Monitor switch	1	AF
1-12	QSW-MA095WRE0	1st. latch switch	1	AF
1-13	QSW-MA095WRE0	2nd. latch switch	1	AF
1-14	QSW-MA095WRE0	3rd. latch switch	1	AF
* 1-15	RC-QZA165WRE0	High voltage capacitor	2	AX
1-16	RLMPTA028WRE0	Oven lamp	1	AK
1-17	RMOTDA209WRE0	Stirrer motor	2	AR
1-18	RTHM-A037WRE0	Magnetron thermal cut-out 145°C	1	AG
1-19	RTHM-A057WRE0	Magnetron thermal cut-out 145°C	1	AG
Δ* 1-20	RV-MZA239WRE0	Magnetron	2	BL
1-21	QFS-CA017WRE0	Weak point A017	1	AF
1-22	QFS-CA007WRE0	Fuse F6.3A	1	AD
1-23	QFS-CA018WRE0	Weak point A018	2	AD
1-24	RR-WZA020WRE0	Monitor resistor 4.3 Ω 20W	1	AF
1-25	FMOTEA309WRK0	Blower motor	1	BH
1-26	RTHM-A058WRE0	Thermal cut-out 115°C	1	AG
* 1-27	RTRN-A459WRE0	High voltage transformer	2	BP
1-28	RFIL-A004WRE0	Ferrite clamp R	2	AM
1-29	RFIL-A002WRE0	Ferrite clamp	2	AP

CABINET PARTS

2- 1	FDAI-A183WRW0	Base plate assembly	1	BC
2- 2	PSHEGA006WRE0	Rubber sheet A	2	AF
2- 3	PSHEGA007WRE0	Rubber sheet B	2	AE
2- 4	GCOVAA250WRW0	Rear cabinet	1	AX
2- 5	FFTASA064WRY0	Oven lamp access cover assembly	1	AN
2-5-1	PCUSU0407WRP0	Cushion	1	AA
2-5-2	PREFHA059WRP0	Lamp reflector	1	AF
2-6	GCABUA523WRP0	Outer case cabinet	1	BA
2-7	PZETEA071WRP0	Cabinet insulation sheet	1	AF

CONTROL PANEL PARTS

3- 1	DPWBFB382WRU0	Control unit	1	BQ
3- 1A	QCNCMA308DRE0	4-pin connector (A)	1	AC
3- 1B	QCNCMA312DRE0	3-pin connector (B)	1	AB
3- 1C	QCNCMA145DRE0	3-pin connector (D)	1	AB
3- 1D	QCNCWA030DRE0	12-pin connector (G)	1	AF
3- 1E	QCNCMA039DRE0	3-pin connector (H)	1	AB
3- 1F	QLUG-A002PRE0	Tab terminal (TAB1-4)	4	AB
3- 1G	RV-KXA053DRE0	Fluorescent display tube	1	AW
3- 1H	PCUSGA359WRP0	Cushion	2	AC
C1	VCKYD11HF104Z	Capacitor 0.1 uF 50V	1	AB
C2	RC-EZA192DRE0	Capacitor 1000 uF 35V	1	AD
C3	VCEAB31HW335M	Capacitor 3.3 uF 50V	1	AA
C4	VCKYB11EX103N	Capacitor 0.01 uF 25V	1	AA
C5	VCEAB31AW476M	Capacitor 47 uF 10V	1	AA
C6-7	VCKYD11CY103N	Capacitor 0.01 uF 16V	2	AA
C8	VCEAB31CW107M	Capacitor 100 uF 16V	1	AB
C9	VCEAB31EW226M	Capacitor 22 uF 25V	1	AA
C20	VCKYD11CY103N	Capacitor 0.01 uF 16V	1	AA
C21	VCKYF31HF103Z	Capacitor 0.01 uF 50V	1	AA
C22	VCKYD11CY103N	Capacitor 0.01 uF 16V	1	AA
C30	VCKYD11CY103N	Capacitor 0.01 uF 16V	1	AA
C61-62	VCEAB31EW226M	Capacitor 22 uF 25V	2	AA
C70	VCKYF31HF103Z	Capacitor 0.01 uF 50V	1	AA
C71	VCKYD11CY103N	Capacitor 0.01 uF 16V	1	AA
C72	VCKYB11EX103N	Capacitor 0.01 uF 25V	1	AA
C74	VCKYD11HF104Z	Capacitor 0.1 uF 50V	1	AB

Note: The parts marked "Δ" may cause undue microwave exposure.
The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
C80	VCEAB31HW104M	Capacitor 0.1 uF 50V	1	AM
C81	VCEAB31HW225M	Capacitor 2.2 uF 50V	1	AA
C82	VCEAB31HW105M	Capacitor 1.0 uF 50V	1	AA
C200	VCKYD11CY103N	Capacitor 0.01 uF 16V	1	AA
CF1	RCRS-A010DRE0	Ceramic resonator CST4.00MGW	1	AD
D1-4	VHD11ES1///-1	Diode (11ES1)	4	AB
D5	VHD1SS270A/-1	Diode (1SS270A)	1	AA
D6-7	VHD11ES1///-1	Diode (11ES1)	2	AB
D61-64	VHD1SS270A/-1	Diode (1SS270A)	4	AA
D70	VHD11ES1///-1	Diode (11ES1)	1	AB
D71	VHD1SS270A/-1	Diode (1SS270A)	1	AA
D81	VHD1SS270A/-1	Diode (1SS270A)	1	AA
D83-84	VHD1SS270A/-1	Diode (1SS270A)	2	AA
D93-97	VHD1SS270A/-1	Diode (1SS270A)	5	AA
IC1	RH-IZA646DRE0	LSI	1	AX
IC2	RH-IZA571DRE0	IC (AT24C04)	1	AP
Q1	VS2SB953-PQ-4	Transistor (2SB953)	1	AG
Q2	VS2SA1561TL-3	Transistor (2SA1561TL)	1	AA
Q20	RH-TZA037CBE0	Transistor (KRA101M)	1	AA
Q40	RH-TZA037CBE0	Transistor (KRA101M)	1	AA
Q41	VS2SB1238// -3	Transistor (2SB1238)	1	AA
Q80	VSDTA114YS/-3	Transistor (DTA114YS)	1	AB
Q81	VSDTD143ES/-3	Transistor (DTD143ES)	1	AC
Q83-84	VSDTB143ES/-3	Transistor (DTB143ES)	2	AC
R1	VRD-B12EF182J	Resistor 1.8k ohm 1/4W	1	AA
R3	VRD-B12HF561J	Resistor 560 ohm 1/2W	1	AA
R4	VRD-B12EF102J	Resistor 1.0k ohm 1/4W	1	AA
R5	VRD-B12EF153J	Resistor 15k ohm 1/4W	1	AA
R6	VRD-B12HF150J	Resistor 15 ohm 1/2W	1	AA
R20	VRD-B12EF153J	Resistor 15k ohm 1/4W	1	AA
R31	VRD-B12EF153J	Resistor 15k ohm 1/4W	1	AA
R32	VRD-B12EF272J	Resistor 2.7k ohm 1/4W	1	AA
R33	VRD-B12EF103J	Resistor 10k ohm 1/4W	1	AA
R40	VRD-B12EF332J	Resistor 3.3k ohm 1/4W	1	AA
R41	VRD-B12EF203J	Resistor 20k ohm 1/4W	1	AA
R42	VRD-B12EF393J	Resistor 39k ohm 1/4W	1	AA
R43	VRD-B12EF103J	Resistor 10k ohm 1/4W	1	AA
R50	VRD-B12EF182J	Resistor 1.8k ohm 1/4W	1	AA
R61-62	VRN-B12EK152F	Resistor 1.5k ohm(F) 1/4W	2	AA
R63-64	VRD-B12EF102J	Resistor 1.0k ohm 1/4W	2	AA
R65-66	VRD-B12EF304J	Resistor 300k ohm 1/4W	2	AA
R67-68	VRD-B12EF473J	Resistor 47k ohm 1/4W	2	AA
R70	VRD-B12EF101J	Resistor 100 ohm 1/4W	1	AA
R71	VRD-B12EF303J	Resistor 30k ohm 1/4W	1	AA
R72	VRD-B12EF112J	Resistor 1.1k ohm 1/4W	1	AA
R73	VRD-B12EF203J	Resistor 20k ohm 1/4W	1	AA
R74	VRD-B12EF332J	Resistor 3.3k ohm 1/4W	1	AA
R79	VRD-B12EF473J	Resistor 47k ohm 1/4W	1	AA
R80	VRD-B12EF471J	Resistor 470 ohm 1/4W	1	AA
R83-84	VRD-B12HF390J	Resistor 39 ohm 1/2W	2	AA
R93-101	VRD-B12EF153J	Resistor 15k ohm 1/4W	9	AA
R200	VRD-B12EF472J	Resistor 4.7k ohm 1/4W	1	AA
R201	VRD-B12EF682J	Resistor 6.8k ohm 1/4W	1	AA
R300	VRD-B12EF105J	Resistor 1.0M ohm 1/4W	1	AA
(J2)	VRD-B12EF822J	Resistor 8.2k ohm 1/4W	1	AB
(J3)	VRD-B12EF363J	Resistor 36k ohm 1/4W	1	AA
RY1	RRLY-A078DRE0	Relay (OJ-SH-118LM)	1	AG
RY3-4	RRLY-A059DRE0	Relay (VS14MB-NR-SH6)	2	AK
SP1	RALM-A003DRE0	Buzzer (PS3025P02)	1	AG
T1	RTRNPA080DRE0	Touch control transformer	1	AU
CT1-2	RTRN-A060DRE0	Current transformer	2	AH
VRS1	RH-VZA010DRE0	Varistor (TNR15G471K)	1	AE
ZD1	VHEHZ12C1// -1	Zener diode (HZ12C1)	1	AA
ZD2	VHEHZ4C3// -1	Zener diode (HZ4C-3)	1	AA
3- 2	FPNLCB159WRK0	Control panel frame with key unit assembly	1	AZ
3- 2-1	FUNTKA775WRE0	Key unit	1	AU
3- 2-2	HDECAA195WRP0	Decoration metal fittings	1	AP
3- 2-3	PCUSUA451WRP0	Cushion	1	AB
3- 3	LANGTA243WRW0	Control panel mounting angle	1	AF
3- 4	XEPSD30P10XS0	Screw; control unit mounting	6	AA
3- 5	XEPSD40P12000	Screw; control panel mounting angle mounting	1	AA
3- 6	XFTSD40P08K00	Screw; decoration panel mounting for earth	1	AB

Note: The parts marked "Δ" may cause undue microwave exposure.
The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
3- 7	PCUSGA380WRP0	Cushion	1	AA

OVEN PARTS

	4- 1	PCUSUA265WRP0	Cushion	1	AA
	4- 2	PDUC-A565WRW0	Exhaust duct	1	AZ
Δ	4- 3	FOVN-A336WRY0	Oven cavity	1	BR
	4- 4	PFILWA053WRP0	Oven light screen	1	AE
	4- 5	MLEVPA153WRF0	Switch lever A	1	AC
	4- 6	MLEVPA154WRF0	Switch lever B	1	AC
	4- 7	MLEVPA155WRF0	Switch lever C	1	AC
	4- 8	MSPRCA075WRE0	Switch spring A	1	AB
	4- 9	MSPRCA076WRE0	Switch spring B	2	AB
Δ	4-10	PHOK-A081WRF0	Latch hook	1	AP
	4-11	PZETEA047WRP0	Switch insulator	1	AC
	4-12	PDUC-A566WRF0	Mg air guide	1	AN
	4-13	PDUC-A567WRF0	Mg air guide cover	1	AN
	4-14	FGLSPA021WRY0	Ceramic shelf	1	BD
	4-15	FPLT-A006WRY0	Stirrer antenna upper assembly	1	AT
	4-16	FPLT-A005WRY0	Stirrer antenna lower assembly	1	AY
	4-17	LANGKA762WRP0	Partition angle R	1	AE
	4-18	LANGQA370WRP0	Oven lamp mounting plate	1	AD
	4-19	LBNDKA075WRP0	Capacitor holder	1	AD
	4-20	PGIDHA054WRW0	Water-proof cover	1	AF
	4-21	NSFTPA031WRF0	Antenna motor shaft	2	AH
	4-22	PCOVPA310WRF0	Splash cover	1	AZ
	4-23	PCUSGA405WRP0	Cushion	1	AF
	4-24	PCUSGA409WRP0	Cushion	2	AE
	4-25	PCUSUA413WRP0	Cushion	1	AG
	4-26	PCUSUA415WRP0	Cushion	2	AC
	4-27	PCUSUA416WRP0	Cushion	4	AC
	4-28	PDUC-A607WRW0	Mg exhaust duct	1	AP
	4-29	PCUSUA414WRP0	Cushion	1	AD
	4-30	LANGQA251WRW0	Noise filter angle	1	AF
	4-31	LANGQ0382WRM0	Earth angle	1	AB
	4-32	LANGFA172WRP0	Chassis support	1	AH
	4-33	LBSHCA012WRE0	Cord bushing	1	AD
	4-34	PCUSGA441WRP0	Cushion	1	AL
	4-35	FFIL-A003WRK0	Air intake filter assembly	1	AV
	4-36	HDECEA001WRP0	Decoration sash	1	AR
	4-37	HDECQA146WRM0	Corner cap left	1	AE
	4-38	HDECQA147WRM0	Corner cap right	1	AE
	4-39	LANGKA679WRM0	Fixing angle s	1	AD
	4-40	MHNG-A215WRM0	Upper oven hinge	1	AG
Δ	4-41	MHNG-A216WRM0	Lower oven hinge	1	AG
	4-42	PCUSGA275WRP0	BLM cushion	1	AB
	4-43	PCUSUA417WRP0	Cushion	1	AB
	4-44	MSPRCA101WRE0	Switch spring C	1	AC
	4-45	PCUSUA458WRP0	V/P cushion	1	AB
	4-46	LANGQA440WRM0	Earth angle	1	AE
	4-47	PCUSGA289WRP0	Cushion	1	AB
	4-48	PCUSUA268WRP0	Cushion	1	AA
	4-49	PZETEA073WRP0	Insulator sheet B	1	AF
	4-50	PCUSUA448WRP0	Cushion	1	AC
	4-51	PCUSGA442WRP0	Cushion	1	AD
	4-52	PCUSGA443WRP0	Cushion	1	AC
	4-53	PCUSUA447WRP0	Cushion	1	AC
	4-54	PCUSGA045WRP0	Cushion	1	AA

DOOR PARTS

Δ	5	DDORFA746WRK0	Door assembly	1	BP
Δ	5- 1	FDORFA289WRT0	Door panel assembly	1	BH
	5- 2	GCOVAA242WRY0	Door case	1	BD
	5- 3	FHNDMA011WRY0	Door release lever assembly	1	AP
	5- 4	GCOVHA350WRF0	Choke cover	1	AR
	5- 5	JHNDPA169WRM0	Door handle	1	AU
	5- 6	LANGKA766WRP0	Outside window fixing plate	2	AF
	5- 7	PCUSGA430WRP0	Cushion	2	AM
	5- 8	PGLSPA457WRE0	Door glass	1	AV
	5- 9	PPACGA142WRP0	Door case packing	2	AF
	5-10	PSHEPA520WRE0	Sealer film	1	AH
	5-11	PSPA-A102WRE0	Door screen spacer	2	AE
	5-12	XFPSD40P08K00	Screw : 4mm x 8mm	3	AA

Note: The parts marked "Δ" may cause undue microwave exposure.
The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
5-13	XHTSD40P08RV0	Screw : 4mm x 8mm	4	AA
5-14	FANGKA200WRY0	Latch fixing angle	1	AQ
5-15	FLEVFA019WRY0	Joint lever	1	AP
5-16	LSTPCA002WRM0	Latch head	2	AM
5-17	MLEVPA220WRF0	Head lever	1	AM
5-18	MSPRCA097WRE0	Latch spring	1	AG
5-19	HBDGCA069WRE0	Door badge	1	AF
5-20	XEPSD40P20000	Screw : 4mm x 20mm	2	AB
5-21	XWSSD40-10000	Washer : 4mm x 1mm	2	AA

MISCELLANEOUS

6- 1	TINSMA004WRR0	Instruction manual (German, French, Dutch, Italian, Spanish)	1	AH
6- 2	TLABHA029WRR0	Menu sticker	1	AC
6- 3	FW-VZB402WRE0	Switch harness	1	AG
6- 4	FW-VZB585WRE0	Main wire harness	1	BB
6- 5	LHLDWA021WRE0	Harness lifter	1	AE
6- 6	TCAUHA083WRR0	Belgium label	1	AB
6- 7	LHLDWA040WRE0	Wire holder A	1	AB
6- 8	TLABSA054WRR0	Fuse label	2	AB
6- 9	PTUB-A042WRE0	Tube	1	AF
6-10	TCAUHA082WRR0	Caution label	1	AC
6-11	LHLDWA043WRE0	Wire saddle S	1	AC
6-12	TLABSA069WRR0	Fuse label F6.3A	1	AB
6-13	TSPCNC161WRR0	Rating label	1	AH
6-14	TCAUHA176WRR0	Caution label	1	AC
6-15	TLABSA064WRR0	A017 label	1	AC
6-16	TLABSA066WRR0	Equipotential label	1	AD
6-17	LHLDWA047WRE0	Space clip	1	AC
6-18	LHLDWQ004YBE0	Purse lock L	1	AA
6-19	LHLDWA023WRE0	Wire saddle	1	AB

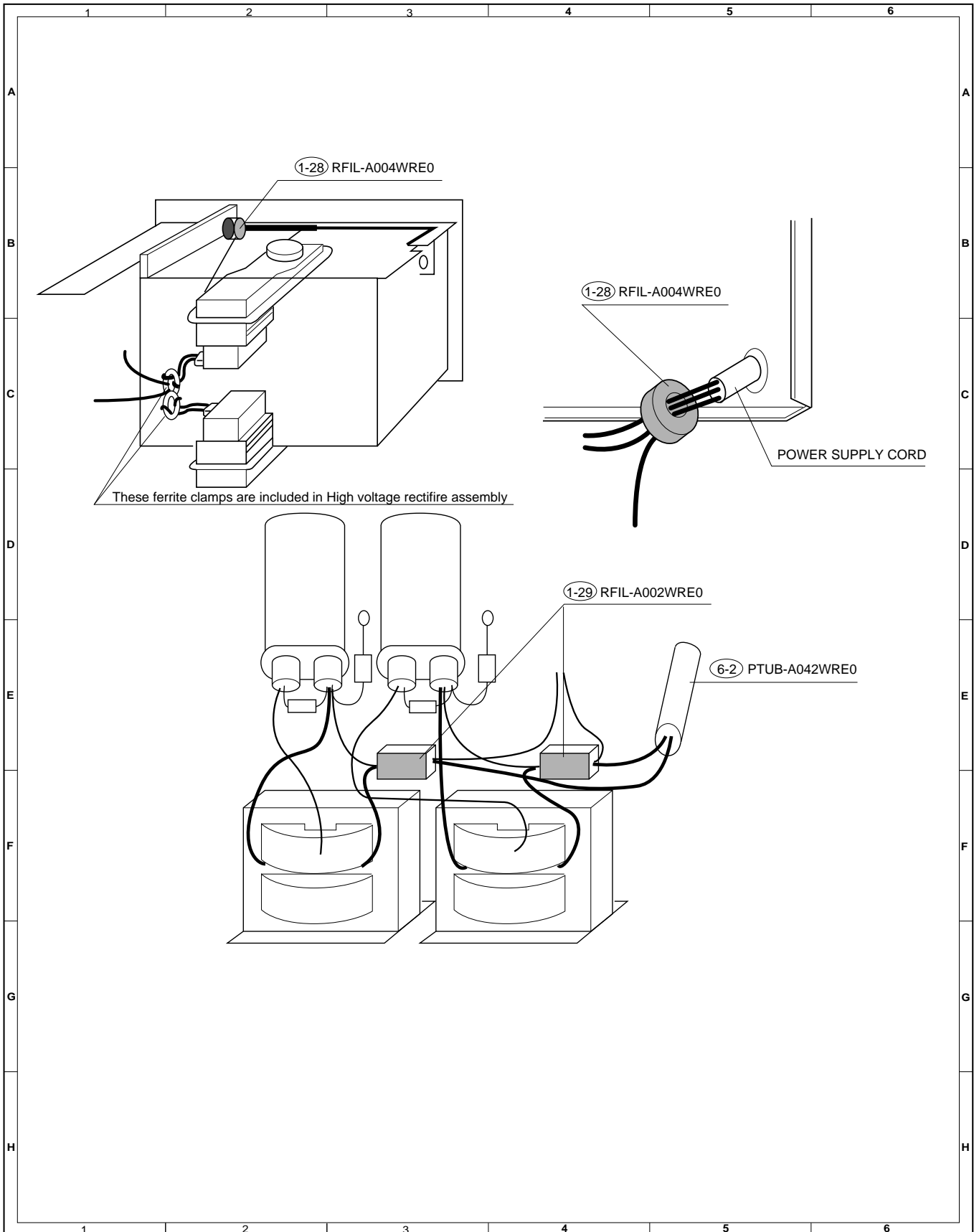
SCRE, NUTS AND WASHERS

7- 1	XCBWW30P08000	Screw : 3mm x 8mm	4	AB
7- 2	XFPSD50P12KS0	Screw : 5mm x 12mm	4	AB
7- 3	XFTSD40P10RV0	Screw : 4mm x 10mm	1	AB
7- 4	XOTSD40P06000	Screw : 4mm x 6mm	2	AA
7- 5	XFTSD40P12000	Screw : 4mm x 12mm	1	AA
7- 6	XWSSD40-10000	Washer : 4mm x 1mm	1	AA
7- 7	LX-WZA035WRE0	Special washer	1	AB
7- 8	XOTWW40P08000	Screw : 4mm x 8mm	4	AB
7- 9	LX-CZA038WRE0	Special screw	2	AA
7-10	PSPA-A101WRE0	Washer	4	AB
7-11	XTBWW40P30000	Screw : 4mm x 30mm	1	AC
7-12	XCBWW30P12000	Screw : 3mm x 12mm	1	AB
7-13	XEPSD30P12XS0	Screw : 3mm x 12mm	3	AB
7-14	LX-CZA057WRE0	Special screw	2	AB
7-15	XHPSD40P05000	Screw : 4mm x 5mm	2	AA
7-16	XHTSD40P08RV0	Screw : 4mm x 8mm	8	AA
7-17	XOTSD40P12000	Screw : 4mm x 12mm	8	AA
7-18	XOTWW40P10000	Screw : 4mm x 10mm	13	AA
7-19	XOTWW40P20000	Screw : 4mm x 20mm	1	AA
7-20	XCPSD30P10000	Screw : 3mm x 10mm	3	AA
7-21	XFPSD40P08K00	Screw : 4mm x 8mm	2	AA
7-22	XOTSD40P12RV0	Screw : 4mm x 12mm	2	AA
7-23	LX-BZA064WRE0	Special screw	1	AA
7-24	XCPSD30P06000	Screw : 3mm x 6mm	3	AA
7-25	XOTSD40P10000	Screw : 4mm x 10mm	2	AA
7-26	XBPUW40P04000	Screw : 4mm x 4mm	4	AB
7-27	XBTUW40P10000	Screw : 4mm x 10mm	2	AA
7-28	XFTSD40P08000	Screw : 4mm x 8mm	1	AA
7-29	XTPSD40P08000	Screw : 4mm x 8mm	2	AA
7-30	XWSSD50-06000	Washer : 5mm x 0.6mm	2	AA
7-31	XONSC40P10000	Screw : 4mm x 10mm	1	AA
7-32	LX-BZA110WRE0	Special screw	4	AC
7-33	XHPSD50P08000	Screw : 5mm x 8mm	8	AB
7-34	XBPSD30P28KS0	Screw : 3mm x 28mm	1	AA
7-35	KNESD30-24000	Nut : 3mm x 2.4mm	1	AA
7-36	XJPSD40P10000	Screw : 4mm x 10mm	2	AA
7-37	XOTSC40P12000	Screw : 4mm x 12mm	6	AA
7-38	LX-EZA004WRE0	Special screw	2	AA

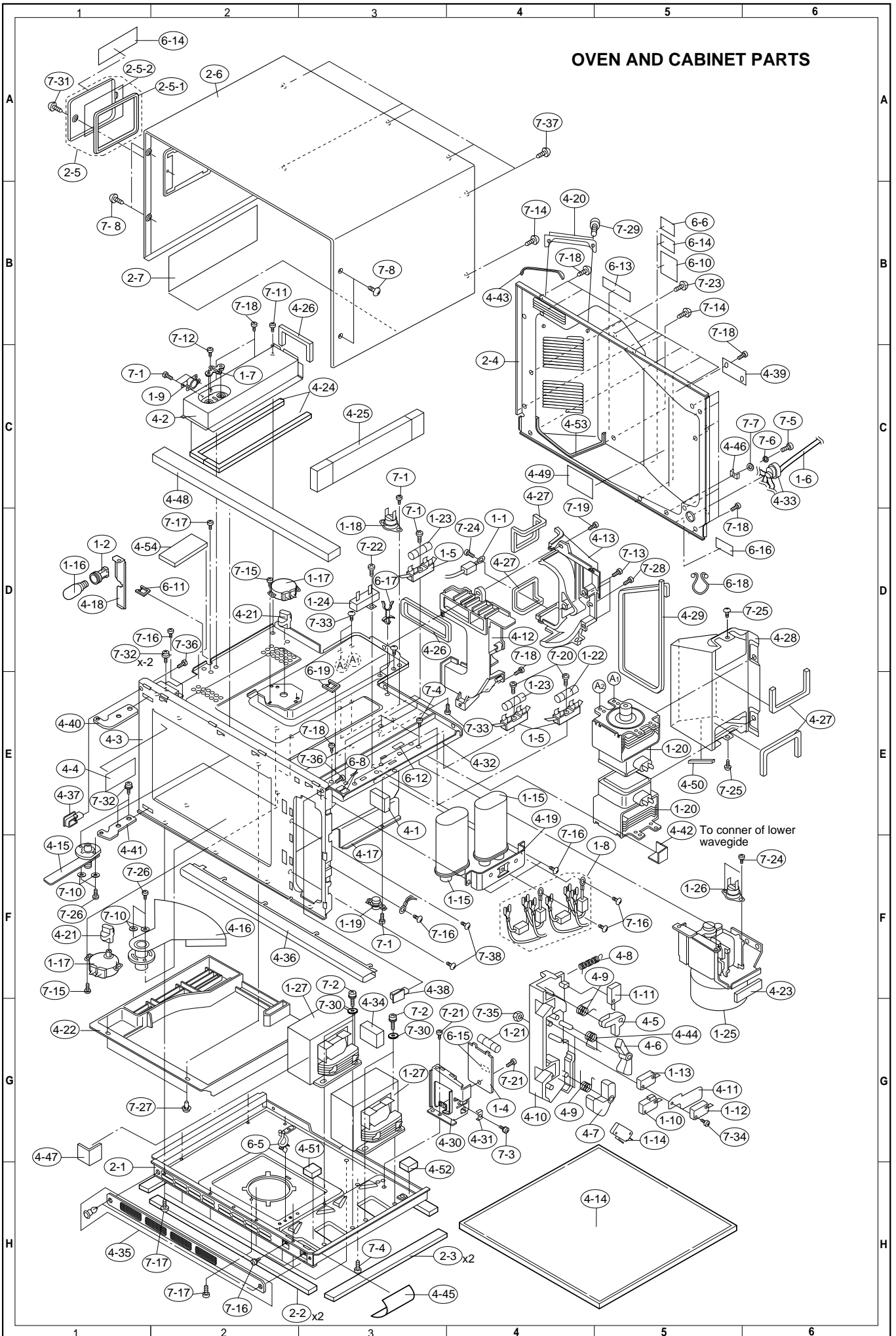
HOW TO ORDER REPLACEMENT PARTS

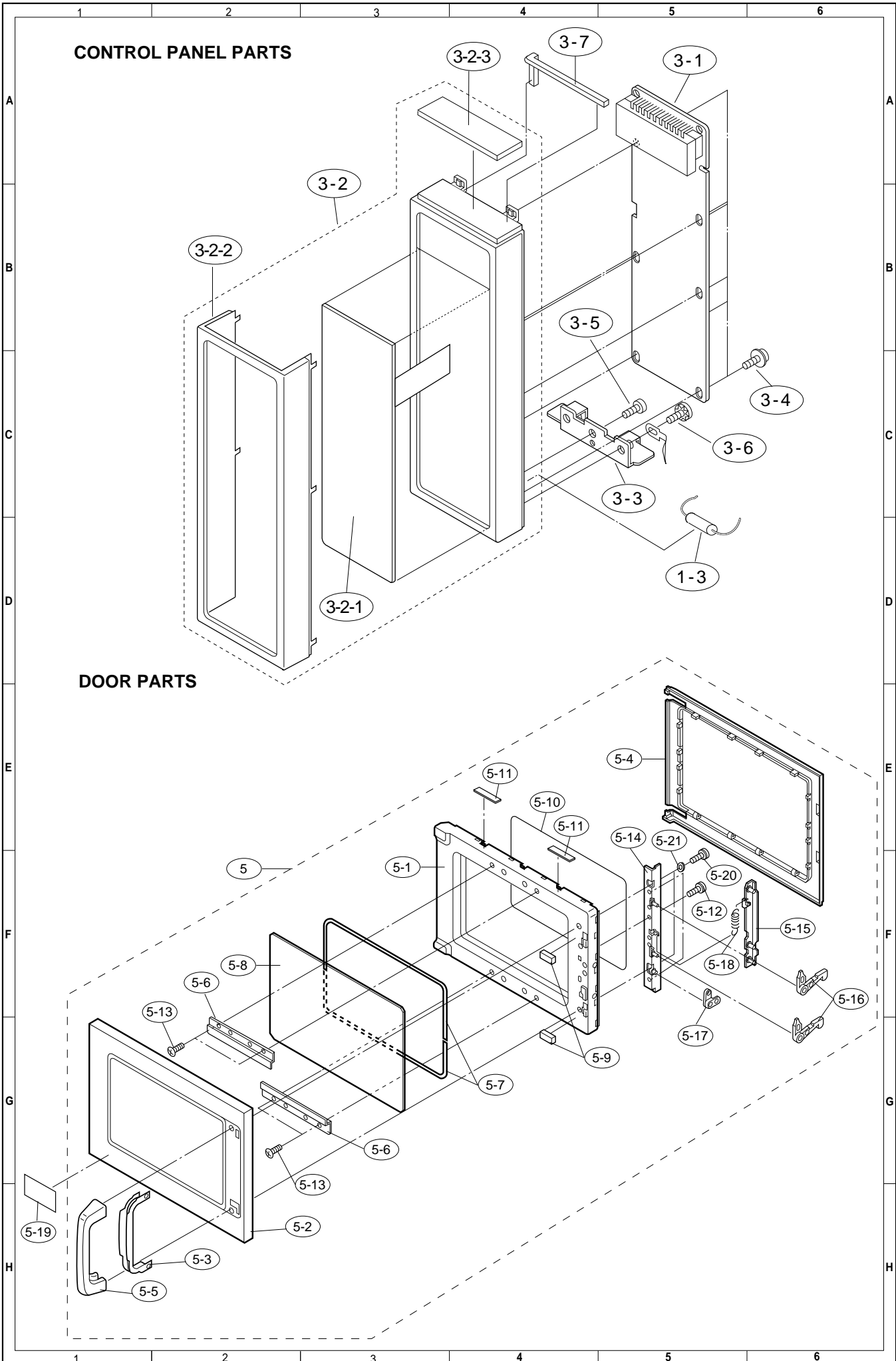
To have your order filled promptly and correctly, please furnish the following information.

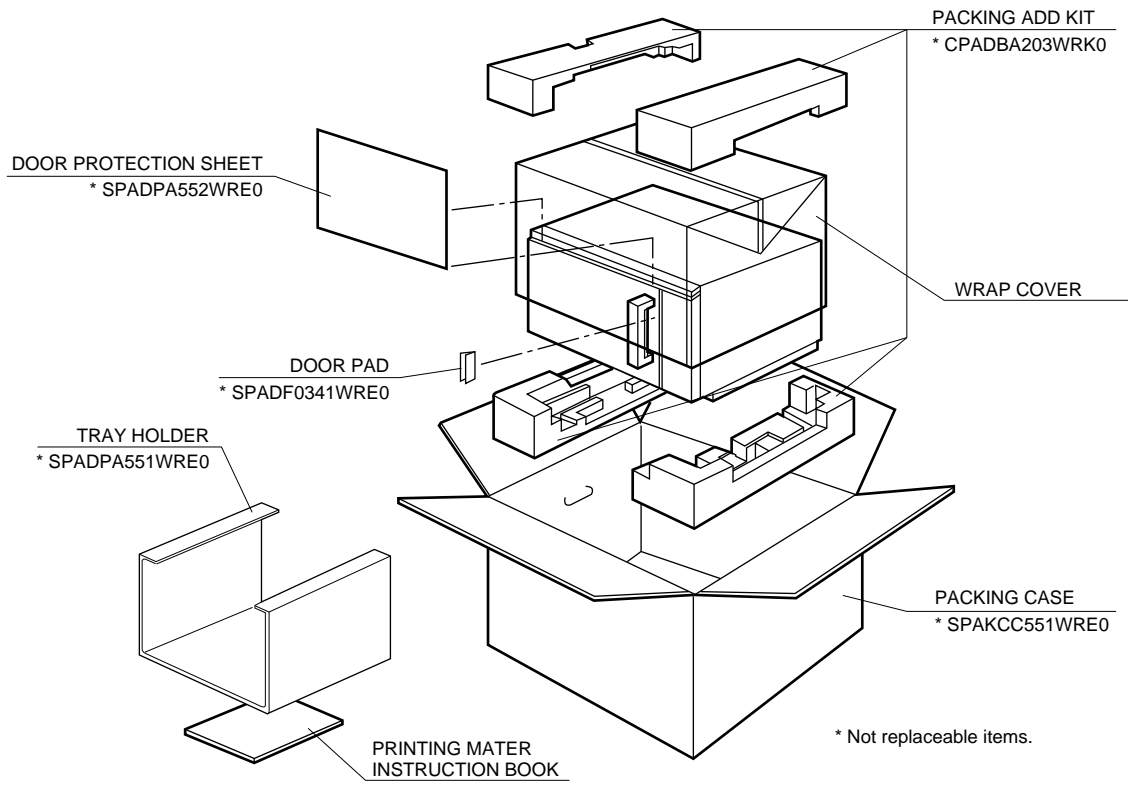
- 1. MODEL NUMBER
- 2. REF. NO.
- 3. PART NO.
- 4. DESCRIPTION



OVEN AND CABINET PARTS







SHARP®